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THRILLING WONDER STORIES

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A Novelette of Time's Vortex
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ILLING
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THE IMMORTALITY SEEKERS
An Interplanetary Novelette
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World Mike

Made especially for home use, attached in a jiffy without tools. Not a toy. Put on your own programs at home, parties, club affairs, etc. Barrels of fun! Easy to operate.

Price Postpaid **25c**

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Large, substantial, attractive. Ideal for radio singing, broadcasting, entertaining. Operates thru your own radio, reproduces voice, loud, clear tone with distortion. Regular table model—can be used by the family. Guaranteed. Connected with 75c and 6 ft. wire. Price

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ic Programs and Sports Everywhere You Go—Loud Tone

Beautiful clear tone while you walk! The amazing midget pocket radio gives you all the entertainment of a radio wherever you go in the country, office or home. Get the latest in sports, music, plays, lectures, etc. Tunes in local broadcasting stations and short wave. Size of a cigarette package, yet it operates perfectly. Beautiful nickel finish. Weighs only 3 ounces. No waste, no batteries, no tubes, no electricity. Long distance reception. New invention. Complete with phones, aerial, ground wire and instructions. Postpaid, $1.00. Phone & Radio Set $1.75.

Transmitter Broadcasting Set

$1

First with the low-priced crystal radio, then the famous World Mike, then the All Wave World and then the Dollar Pocket Radio, and **NOW** a genuine SPITFIRE that sends out messages for miles, for only 1 10c postage. Note these sensational Features:

cked up on a suitable Radio Receiver ike, but a complete Broadcasting Set ete with key, in Kit Form s in to any AC-DC circuit e 2 oscillating tubes itter, $1.00 plus 10c post. Tubes (use 2) Each 50c

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ONE TRIAL! WATER WINGS

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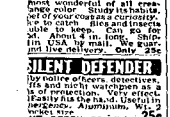
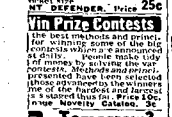


SILENT DEFENDER



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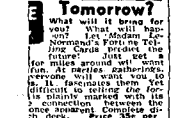

Tomorrow?

What will it bring for you? What will happen? Let Professor Norwood's Forecasting Device tell you. Reveals the future and the past for you. Gives you a true ground-work to go by. Tells what will want you to do. It is simple. There is no difficult to telling the future by this device. It shows the connection between the once present and the present. Price 35c postpaid. With 50 ivory finished cards.

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BUZZER 28c

Make-Up Kit

Pocket Telescope

Eagle Eye Vision

Six Power

25c

Big, 3 draw, 6 power telescope for only 25c! Swell for outdoor study, sports, looking at the stars, etc. Pocket telescope by using smoked glass or view through it in Sun Spots. Price 25 cents

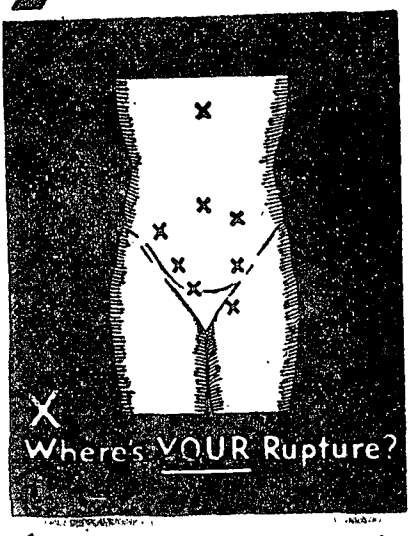
IRWIN PROJECTOR

A real Electric Movie Machine for only 35c! Shows pictures almost 3 feet wide, 3 feet high in size. Just insert the film, turn the crank and the pictures flicker on the screen like! Uses 2 flashlight cells obtainable anywhere. Complete with 2 reels of interesting 5x5x3 inches. Complete with bulb, ready to use. 16 mm. film. Price 35c. Films, choice of Felix the Cat, Wild West, Mutt & Jeff or Bathing Girls. Price 15c each.

FUN LICENSES 10c

Large size, nicely printed with seal, ribbon and signature. Hand one of these to your friend and tell him/her/it/yourself that you have a Doctor Certificate or Certificate of Death, Certificate of Arrest, Warrant, Diploma or Marriage Certificate. Also Certificate of Ignorance, Certificate of Insanity, Certificate of Stupidity, Diploma of Idiocy, Diploma of Fatherhood, Diploma of Motherhood, Certificate of Athletic Ability, Certificate of Good Behavior, Diploma of Bachelorhood, Diploma of Spinsterhood, Certificate of Ugliness, Certificate of Beauty, Certificate of Fatness, Certificate of Leanness, Certificate of Baldness, Certificate of Hairiness, Certificate of Fatherhood, Certificate of Motherhood, Certificate of Bachelorhood, Certificate

don't Worry about Rupture



● Why put up with days . . . months . . . YEARS of discomfort, worry and fear? Learn how about this perfected invention for all forms of reducible rupture. Surely you keenly desire—you eagerly CRAVE to enjoy life's normal activities and pleasures once again. To work . . . to play . . . to live . . . to love . . . with the haunting Fear of Rupture banished from your thoughts! Literally *thousands* of rupture sufferers have entered this *Kingdom of Paradise Regained.* Why not you? Some wise man said, "Nothing is impossible in this world"—and it is true, for where others fail is where we have had our greatest success in many cases! Even doctors—thousands of them—have ordered for themselves and their patients. Unless your case is absolutely hopeless, *do not despair.* The coupon below brings our Free Rupture Book in plain envelope. Send the coupon now.

Patented AIR-CUSHION Support Gives Nature a Chance to Close the OPENING

Think of it! Here's a surprising yet simple-acting invention that permits Nature to close the opening—that holds the rupture securely but gently, day and night, at work and at play! Thousands of grateful letters express heartfelt thanks for results beyond the expectation of the writers. What is this invention—How does it work? Will it help me? Get the complete, fascinating facts on the Brooks Automatic Air Cushion Appliance—send now for *free* Rupture Book.

Cheap—Sanitary—Comfortable

Rich or poor—ANYONE can afford to buy this remarkable, LOW-PRICED rupture invention! But look out for imitations and counterfeits. The Genuine Brooks is never sold in stores or by agents. Your Brooks is made up, after your order is received, to fit your particular case. You buy direct at the low "maker-to-user" price. The perfected Brooks is sanitary, lightweight, inconspicuous. Has no hard pads to gouge painfully into the flesh, no stiff, punishing springs, no metal girdle to rust or corrode. It brings heavenly comfort and security—while the Automatic Air Cushion continually works, in its own, unique way *to help Nature get results!* Learn what this patented invention can mean to you—send coupon quick!

PROOF!

Read These Reports on Reducible Rupture Cases

(In our files at Marshall, Michigan, we have over $1,000 grateful letters which have come to us entirely unsolicited and without any sort of payment.)

Likes Brooks Best

"I bought one of your Rupture Appliances in 1933, wore it day and night for one year and laid it aside last December. The rupture hasn't bothered me since. I used several others without success until I got a Brooks."—J. B. McCarter, Route 2, Box 104, Oregon City, Ore.

"Runs and Plays"

"My son has not worn the Appliance for over a year. He wore one for ten years and I am very grateful now to think he has laid it aside. He is twelve years old, runs and plays hard like all boys and is never bothered about the rupture."—Mrs. M. George, Route 1, Box 103, Cumberland, Md.

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185-H State Street, Marshall, Mich.

Without obligation, please send your FREE BOOK on Rupture, PROOF of Results, and TRIAL OFFER—all in plain envelope.

Name.....

Street.....

City..... State.....

State whether for ☐ Man, ☐ Woman, or ☐ Child.

C. E. BROOKS, Inventor

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No . . . don't order a Brooks now—FIRST get the complete, revealing explanation of this world-famous rupture invention, THEN decide whether you want the comfort—the freedom from fear and worry—the security—the same amazing results thousands of men, women and children have reported. They found our invention the answer to their prayers! Why can't *you?* And you risk nothing as the complete Appliance is *sent on trial.* Surely you owe it to yourself to investigate this no-risk trial. Send for the facts now—today—hurry! All correspondence strictly confidential.

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THRILLING WONDER STORIES

The Magazine of Prophetic Fiction

VOL. 10 NO. 2

October, 1937

IN THE NEXT ISSUE

THE TENTH WORLD
A Penton and Blake Novelette
By
JOHN W. CAMPBELL, JR.

A MONTH A MINUTE
A Space-Time Novelette
By
RALPH MILNE FARLEY

THE MIND MAGNET
A Novelette of the Stratosphere
By
PAUL ERNST

A SPECIAL ARTICLE ON ROCKETS
By
WILLY LEY

—plus many other unusual novelettes, stories and features.

EVERY STORY BRAND-NEW

Table of Contents

COMPLETE NOVELETTES

THE HOTHOUSE PLANET
By ARTHUR K. BARNES..... 12

THE IMMORTALITY SEEKERS
By JOHN W. CAMPBELL, JR..... 40

THE CAVERN OF THE SHINING POOL
By ARTHUR LEO ZAGAT..... 66

A COMET PASSES
By EANDO BINDER.....102

THRILLING SHORT STORIES

THE SPACE-TIME-SIZE MACHINE
By RAY CUMMINGS..... 30

HOLMES' FOLLY
By EDMOND HAMILTON..... 59

VIA ETHERLINE
By GORDON A. GILES..... 79

WHEN THE EARTH LIVED
By HENRY KUTTNER.....90

SPECIAL PICTURE FEATURES

ZARNAK
By MAX PLAISTED..... 87

IF—
By JACK BINDER.....101

SCIENCE FEATURE

SCIENTIFACTS
By J. B. WALTER..... 64

OTHER STORIES AND FEATURES

TEST YOUR SCIENCE KNOWLEDGE..... 37
SCIENTIBOOK REVIEW 100
SCIENCE QUESTIONS AND ANSWERS.....114
THE READER SPEAKS.....116
SCIENCE FICTION LEAGUE.....118
THE STORY BEHIND THE STORY.....120
THE "SWAP" COLUMN.....128
FORECAST FOR THE NEXT ISSUE.....129

ON THE COVER

One of the giant denizens of the jungles of Venus attacks a Luckless explorer. This painting depicts a scene in Arthur K. Barnes' novelette, THE HOTHOUSE PLANET.

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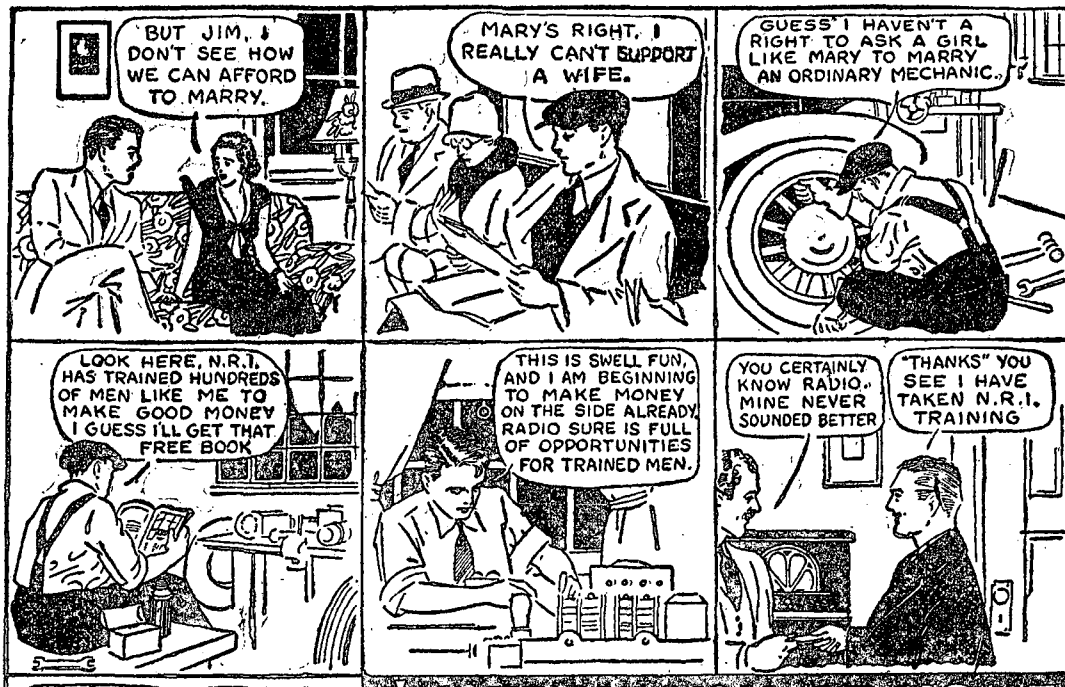
BUT JIM, I DON'T SEE HOW WE CAN AFFORD TO MARRY.
MARY'S RIGHT. I REALLY CAN'T SUPPORT A WIFE.
GUESS I HAVEN'T A RIGHT TO ASK A GIRL LIKE MARY TO MARRY AN ORDINARY MECHANIC.
LOOK HERE, N.R.I. HAS TRAINED HUNDREDS OF MEN LIKE ME TO MAKE GOOD MONEY I GUESS I'LL GET THAT FREE BOOK
THIS IS SWELL FUN, AND I AM BEGINNING TO MAKE MONEY ON THE SIDE ALREADY. RADIO SURE IS FULL OF OPPORTUNITIES FOR TRAINED MEN.
YOU CERTAINLY KNOW RADIO. MINE NEVER SOUNDED BETTER
"THANKS" YOU SEE I HAVE TAKEN N.R.I. TRAINING
OH! JIM, IT'S WONDERFUL. NOW YOU'RE ON THE WAY TO SUCCESS
YES MARY, AND THERE'S A REAL FUTURE FOR US IN THIS RADIO FIELD.

I'LL TRAIN YOU AT HOME in Your Spare Time For A GOOD RADIO JOB

Many Radio Experts Make $30, $50, $75 a Week

Do you want to make more money? Broadcasting stations employ engineers, operators, station managers and pay up to $5,000 a year. Spare time Radio set servicing pays as much as $200 to $500 a year—full time servicing jobs pay as much as $30, $50, $75 a week. Many Radio Experts own their own full or part time Radio businesses. Radio manufacturers and jobbers employ testers, inspectors, foremen, engineers, servicemen, paying up to $6,000 a year. Radio operators on ships get good pay and see the world. Automobile, police, aviation, commercial Radio, loud speaker systems offer good opportunities now and for the future. Television promises many good jobs soon. Men I trained have good jobs in these branches of Radio.

Many Make $5, $10, $15 a Week Extra in Spare Time While Learning

Almost every neighborhood needs a good spare time service man. The day you enroll I start sending you Extra Money Job Sheets. *They show you how to do Radio repair jobs;* how to cash in quickly. Throughout your training I send plans and ideas that have made good spare time money for hundreds of fellows. I send special Radio equipment to give you practical experience—show you how to conduct experiments, build circuits illustrating important Radio principles.

Find Out What Radio Offers You

Mail the coupon now for "Rich Rewards in Radio." It's free to any fellow over 16 years old. *It points out Radio's* spare time and full time opportunities, also those coming in Television; tells about my Training in Radio and Television; shows you letters from men I trained, telling what they are doing, earning; shows my Money Back Agreement. MAIL COUPON in an envelope, or paste on a post card—NOW!

J. E. SMITH, President, Dept. 7K09,
National Radio Institute, Washington, D. C.

J. E. SMITH, President National Radio Institute
Established 1914

The man who has directed the home study training of more men for the Radio Industry than any other man in America.

THIS FREE BOOK HAS HELPED HUNDREDS OF MEN MAKE MORE MONEY

HERE'S PROOF THAT MY TRAINING PAYS

Chief Operator Broadcasting Station

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"I now have my own Radio business which shows three hundred dollars a month profit — thanks again to National Radio."—FRANK T. REESE, 39 N. Felton St. Philadelphia, Penna.

Earned $50 First Month in Spare Time.

"I knew nothing about Radio. After *four lessons I* began servicing Radios, earning $50 the first month. Last winter I made as high as $100 a month in spare time."—G. F. WALTON, 808 West Olney Road, Norfolk, Va.

J. E. SMITH, President, Dept. 7K09,
National Radio Institute, Washington, D. C.

Dear Mr. Smith: Without obligating me, send "Rich Rewards in Radio," which points out the spare time and full time opportunities in Radio and explains your 50-50 method of training men at home in spare time to become Radio Experts. (Please write Plainly.)

NAME.....AGE.....

ADDRESS.....

CITY.....STATE.....

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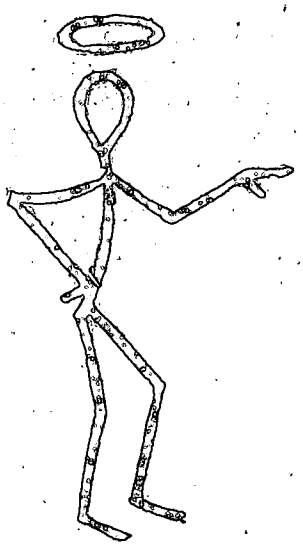
MEET THE SAINT



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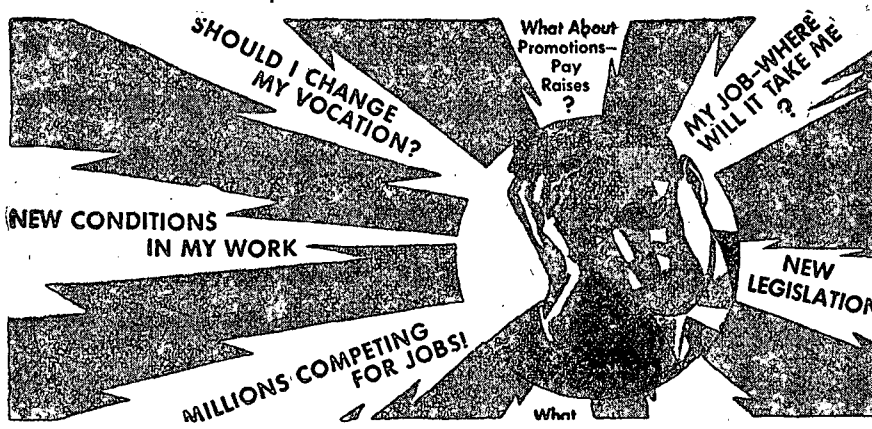
SHOULD I CHANGE MY VOCATION?
What About Promotions—Pay Raises ?
MY JOB—WHERE WILL IT TAKE ME ?
NEW CONDITIONS IN MY WORK
NEW LEGISLATION
MILLIONS COMPETING FOR JOBS!
What

WHERE DO YOU GO FROM HERE?

YOU'RE like a million other men—you're facing a *big* question. The depression turned business topsy-turvy and now the rebuilding period stares you in the face.

Are the things that are happening today going to help or hinder you—what will they mean in your pay check? Where will they put you five, ten, twenty years from now? How can you take full advantage of this period of opportunity?

We believe you will find the answer here—a suggestion the soundness of which can be proven to you as it has been to thousands of other men.

The whole trend today—legislation, spirit, action—is to put men back to work, raise earning and spending power, *give every man a fair chance to work out his own salvation.*

The road to success remains unchanged but, bear this in mind, *what it takes to win is radically different!*

No employer today would dare risk an important post in the hands of a man who had not learned the lesson of '29. Why should he, when right at this moment he can pick and choose and get almost any man he wants at his own price?

Business organizations are rebuilding—reorganizing for the new conditions. Before it is over every man and every method will be judged in the cold light of reason and experience—then dropped, remade or retained. This spells real opportunity for the man who can meet the test—but heaven help the man who still tries to meet today's problems from yesterday's standpoint! Out of the multitude still jobless there are sure to be many frantically eager to prove him wrong and take his place.

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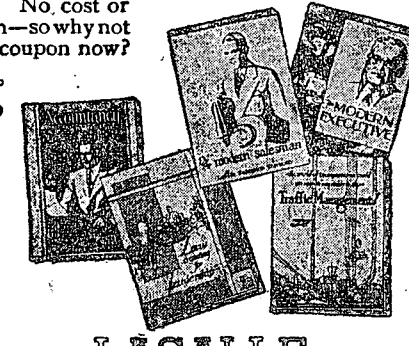
This is a serious study of the possibilities and opportunities in that field. It is certain to contain an answer to vital questions bothering you today about your own work and earning power.

Send for these booklets—coupon brings them free. Be sure to check the LaSalle training that interests you most. We will tell you also how you can meet and take fullest advantage of today's situation. No cost or obligation—so why not mail the coupon now?



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Position .....

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I laughed when the man I loved objected.

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one of the many sensational true stories of life and love in October

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AUTOMATICALLY STOPS
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9 TOUCH BUTTONS BRING IN
9 STATIONS—IN A FLASH!

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SIX-CONTINENT
DIAL

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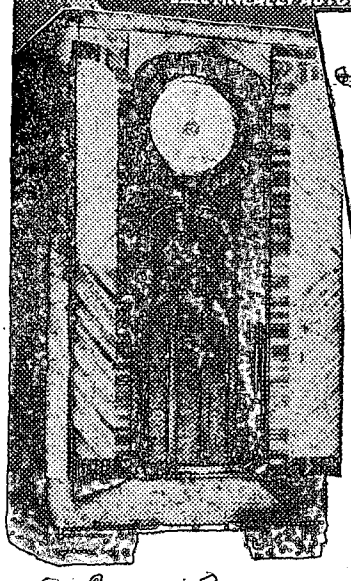

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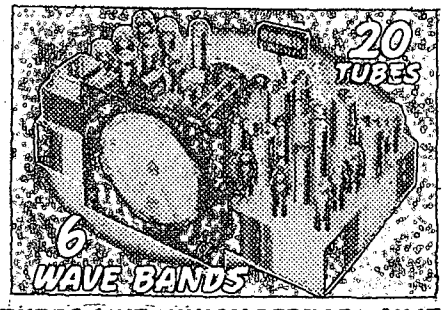
NEW LOW BASE
PRICE



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Why be content with an ordinary 10, 12 or 14-tube set, when you can buy a 20-tube Super DeLuxe ELECTRIC TUNING Midwest for the same money! It will surprise and delight you with its brilliant world-wide reception on 6 bands. You save 50%—and get 30 days *free* trial in your own home—when you buy direct from the factory at wholesale prices. You are triply protected with Foreign Reception Guarantee. One-Year Warranty and Money-Back Guarantees.

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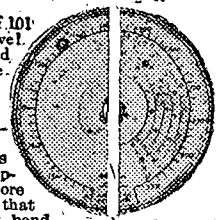

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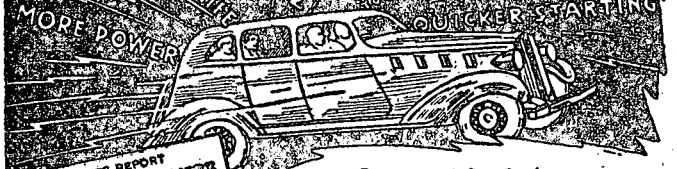

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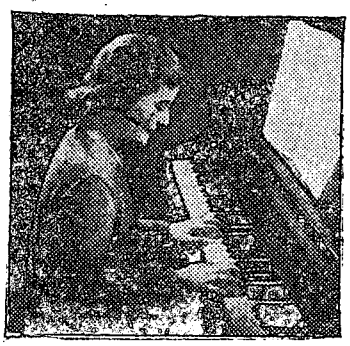

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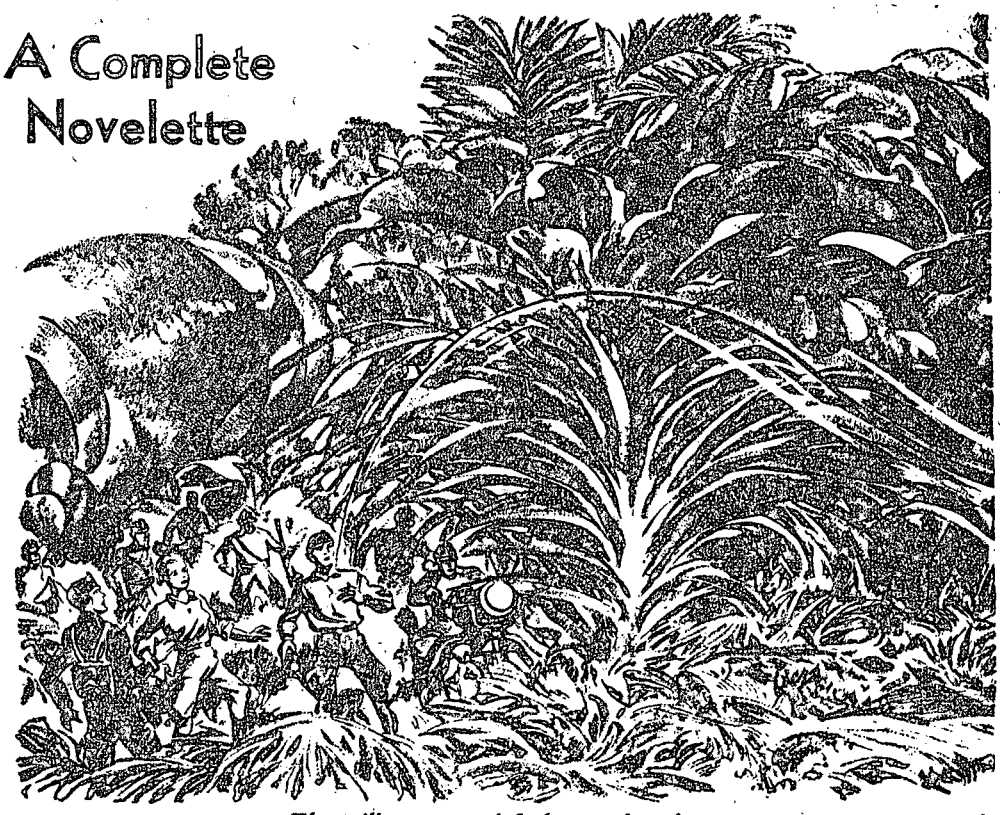
Gerry Carlyle, Frank Buck of the Future,

A Complete Novelette



The coiling sweep of flesh rope darted out

THE HOTHOUSE

Strange Forms of Life Rule the Steaming

CHAPTER I

The Ark

DAY again. One hundred and seventy dragging hours of throttling, humid heat. An interminable period of monotony lived in the eternal mists, swirling with sluggish dankness, enervating, miasmatic, pulsant with the secret whisperings of mephitic life-forms. That accounted for the dull existence of the Venusian trader, safe in the protection of his stilt-legged trading post twenty feet above the spongy earth, but bored to the point of madness.

Tommy Strike stepped out from under the needle-spray antiseptic shower that was the Earthman's chief defense against the myriad malignant bacterial infections swarming the hothouse that is Venus. He grabbed a towel, made a pass at the lever to turn on the refrigeration unit that preserved them during the hot days, shut off the night heating system, and yelled:

"Roy! Awake! Arise! Today's the great day! The British are com-

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Searches the Swamps of Venus for a Murri

PLANET

By ARTHUR K. BARNES

Author of "The Emotion Solution," "Green Hell," etc.

ing! Wake up for the event!"

Roy Ransom, Strike's assistant, staggered into view rubbing the sleep from his eyes.

"British?" he mumbled. "What British?"

"Why, Gerry Carlyle. The great Carlyle is coming today, in his special ship, with his trained crew, straight from the Interplanetary Zoo in London. The famous 'Catch-'em-alive' Carlyle is on his way, and we're the lucky guys chosen to guide him on his expedition on Venus!"

Ransom scratched one thick, hairy

Jungles of a Far-Distant World!

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leg and stepped under the shower with a sour expression.

"Ain't that somethin'?" he inquired.

"You don't look with favor on Mister Carlyle?" Strike chuckled.

"No, I don't. I've heard all I want to hear about him. Capturing animals from different planets and bringing them back alive to the Zoo in London is all right; I'd like the job myself. But any guy that rates the sickening amount of publicity he does must have something phony about 'im!" He kicked toward the short-wave radio in one corner of the living room. "Bein' so close to the sun, we're lucky if we bring in a couple of Earth programs a day through the interference. And it seems to me every damn' one of 'em has something about the famous Carlyle. Gerry Carlyle eats Lowden's Vita-cubes on expedition. Gerry Carlyle smokes germ-free Suaves. Gerry Carlyle drinks refreshing Alka-lager. *Pfui!*

"An' now we're ordered to slog around this dripping planet for 'im, doing all the work of bagging a bunch of weird specimens for the yokels t' gape at, while he gets all the glory back home!"

Tommy Strike laughed good-naturedly.

"You're all bark and not much bite, Roy. You're just as glad as I am something's turned up to relieve the monotony." He brought out his daytime clothes, singlet and trousers of thin, rubberized material, and the inevitable broad-soled boots for traversing the treacherous soft spots on Venus' surface.

"Yeah?" retorted Ransom. "I can tell you one thing this visit'll turn up, an' that's trouble! Sure as you're born, Tommy, that guy's comin' here to get two or three *Murris*—he hopes! An' you know what that'll mean!"

Strike's eyes clouded. There was truth in Ransom's remark. Hunting for the strange little creatures called *Murris* never had resulted in anything but trouble since the day Sidney Murray, co-leader of the first great Venusian exploration party, the Cecil Stanhope—Sidney Murray Expedition, first set eyes upon them.

"Well," he shrugged, "we can stall just before he's ready to leave, and have *some* fun at least. Maybe, too, he'll listen to reason!"

RANSOM snorted in wordless disgust at this fantastic hope.

"Anyhow," insisted Strike, determined to see the cheerful side, "even if there is any disturbance, it always blows over in a few days. I'm heading for the landing field; they're just about due."

Tommy Strike stepped outside into the breathlessly hot, blinding mist, thick with the stench of rot and decay. Earthly eyes could not penetrate this eternal shroud for more than a hundred feet at a time, even when a wind stirred the stuff up to resemble the churning of a weak solution of dirty milk. Strike grimaced and thoughtlessly filled and lit his pipe.

Thirty seconds later the air became filled with the thin screams and bangings of dozens of the fabulous whiz-bang beetles as they hurtled their armored bodies blindly against the metal walls of the station, attracted by the odor of tobacco. Strike flinched and hurriedly doused the pipe. A man couldn't even have the solace of a smoke on this damned planet; his life would be endangered by the terrific speed of those whiz-bangs.

A few steps took Strike to the safety of the rear of the station, where abandoned calcium carbonate tanks loomed like metal giants in the fog. There was a time when it had been necessary to pump the stuff to the miniature space-port a safe distance away whenever a ship was about to land. There, sprayed forth from thousands of tiny nozzles high into the air, its tremendous affinity for water carved a cleared vertical tunnel in the fog for the approaching space ship pilot. New telescopic developments, however, rendered the device obsolete.

Strike paced deliberately along the trail that paralleled the ancient pipeline—Earthlings soon learn not to over-exert in that atmosphere—and before he had covered half of it his quick ears caught the shrill whine of a space craft plunging recklessly into the Venusian air-envelope. It rose to a nerve-rasping pitch, then dropped

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sharply away to silence. And presently, sounding curiously muffled and distorted through the clouds, came the noise of opening ports, the clang of metal upon metal, voices.

Gerry Carlyle and company had arrived.

Strike increased his pace somewhat and shortly entered the clearing that served as space-port. He paused to let his amazed eyes roam over the unaccustomed sight. Gerry Carlyle's famous expeditionary ship was an incredible monster of gleaming metal, occupying almost the entire field, towering into the air further than the eye could reach in that atmosphere. Its green glass portholes were glowing weirdly, as they looked down upon the stranger, from the ship's lights.

THE craft was immense, approaching in size the giant clipper ships that traveled to the furthermost reaches of the System. Strike had never before been so close to a ship of such proportions. He smiled at sight of the name on her bow. *The Ark.*

The Ark, of course, was one of the new centrifugal flyers, containing in her stern a centrifuge of unbelievable power, with millions of tiny rotors running in blasts of compressed air, generating sufficient energy to hurl the ship through space at tremendous speeds. The equipment of *The Ark,* too, was the talk of the System.

Carlyle, backed by the resources of the Interplanetary Zoo, had turned the ship into a floating laboratory, with a compartment for the captured specimens arranged to duplicate exactly the life conditions of their native planets. All the newer scientific inventions were included in her operating apparatus—the paralysis ray, antigravity, electronic telescope, a dozen other things that Strike knew by name only.

Strike's musings were interrupted by the approach of a snappily uniformed man. The fellow saluted, smiling.

"Are you Mr. Strike?" he asked. "I'm sub-pilot Barrows, of *The Ark,* and very glad to meet you. Gerry Carlyle will see you at once. We're anxious to get to work immediately."

This day was to be one of many surprises for Tommy Strike, and perhaps the greatest shock of all was received when he stood beside the sloping runway leading into the brightly lighted belly of the ship. For awaiting him there, one hand outstretched and a cool little smile on her lips, stood the most beautiful girl he had ever seen.

"Mr. Strike," said Barrows, "this is Miss Gerry Carlyle."

Strike stared, thunderstruck. In those days of advanced plastic surgery, feminine beauty wasn't rare, but even Strike's unpracticed eye knew that here was the real thing. No synthetic blonde baby-doll here, but a natural beauty untouched by the surgeon's knife—spun-gold hair, intelligence lighting her dark eyes, a hint of passion and temper in the curve of her mouth and arch of her nostrils. In short, a woman.

Miss Carlyle's voice was an ice-water jet that reminded Strike of his manners.

"You don't seem enthusiastic over your temporary employer, Mr. Strike. Something wrong about me?" She withdrew her fingers from Strike's grasp and watched the crimson tide crawl up his neck.

"Oh. Oh, no." Strike fumbled for words. "That is, I'm surprised that you're a woman. I—we expected to find a man in—well, in your position. It's more like a man's job."

Sub-pilot Barrows could have warned Strike that this was a touchy point with Gerry Carlyle, but he had no chance. The girl drew herself up and pointed out coldly:

"There isn't a man in the business who has done even nearly as well as I. Name a half-dozen hunters! Rogers, Camden, Potter—they aren't in the same class with me. Man's job? I think you needn't worry about me, Mr. Strike. You'll find I'm man enough for anything this planet has to offer!"

Strike's eyebrow twitched. Huh. An arrogant hussy, withal. Terrific sense of her own importance, wilful, selfish. He decided he didn't like her, and rather hoped she *had* come look-

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ing for *Murris*. If so, she would learn one or two bitter lessons.

There followed a five-minute interlude of scurrying about and shouting and unloading, all done to the tune of Gerry Carlyle's voice, which could crack like a whip-lash when issuing commands. Then Strike found himself leading a small party back to the trading post with Miss Carlyle's arm surprisingly through his, her red lips asking a hundred questions, golden head bent as she listened with flattering attention.

FIRST she wished to know about the business of the trading post.

"It isn't very exciting," Strike told her. "Mostly sitting around being bored stiff, playing cards or fiddling with a bum radio. Several times during a Venusian day our natives bring in a load of some of the medicinal plants for which we're up here to trade. Occasionally a rough gem of one kind or another, though Venus is very poor in minerals. Only stone really worth much to be found up here is the emerald."

Gerry Carlyle could scarcely believe that there was any profit in medicinal plants, considering transportation costs.

"Surely there isn't enough in it to persuade a young man like you to bury himself in—in this." She waved her hand around disparagingly.

"There's profit in it, all right," Strike shrugged. "The drugs distilled from some of the Venusian growths are plenty valuable. And then there's the adventure angle." He smiled wryly. "Plenty of young bucks are willing to sign a three-year contract for the thrills of living on Venus, if they don't know anything about it beforehand. But it does take an awful lot of that stuff to bring a transport ship our way. We seldom see a ship more often than three or four Earth-months apart."

The girl next directed his attention to the thousands of fungi now springing up through the moist earth with almost visible movement. They were shaped somewhat like the human body, and so pale they seemed like a host of tiny corpses rising from their graves.

Strike grimaced; he had never liked those damned things. They reminded him constantly that battle and destruction were the watchwords in this hellhole, where the fang of every creature was turned upon his neighbor, and the plants had poisoned thorns, and even the flowers gave off noxious gases to snare the unwary.

"Yes," he said. "They grow and propagate amazingly fast. Many of the smaller life-forms here exist only a single day—they are born, live, and die in one hundred and seventy hours. Naturally their life cycle is speeded up. In a few hours, all these puff-ball fungi will begin popping at once to spread their spores around. It's a funny sight.

"During the long night, of course, the spores lie dormant. And most of the larger creatures hibernate from the intense cold. Our night life up here is nil; this is a nine o'clock planet for sure!"

Gerry Carlyle observed what all newcomers observe the minute they set foot on Venus: although the view is a drab, almost colorless one, an incredible multiplicity of odors assails the nostrils: sweet, sharp, musklike, pungent, spicy, and many unfamiliar scents as well.

Strike explained this, too. On Earth, flowering plants are fertilized by the passage of insects from one bloom to another. For this reason they develop petals of vivid colors, to attract bees and butterflies and other insects. But on Venus, where perpetual mist renders impotent any appeal to the sense of sight, plants have adapted themselves to appeal to the sense of smell, and thus give off all sorts of enticing odors.

So it went, the intimate give and take of question and answer and the pleasant business of getting acquainted, until the all-too-short walk to the station was over. But Strike was not deceived by the girl's sudden change of attitude. He knew that an interplanetary hunter of Gerry Carlyle's experience would have certainly read up on Venus before ever coming there; he realized she knew the answers already to every question she

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asked.

She had simply noticed Strike's disapproving eyebrow during the first moments of their meeting, and had deliberately determined to ingratiate herself with him to promote harmony during her brief stay on the cloudy planet. Strike was willing to harmonize, but he looked upon the girl with caution and distaste. No man likes any woman to think she's bamboozling him.

CHAPTER II

The Hunters

GERRY Carlyle was decidedly a woman of action.

"No time to waste," she declared incisively as they reached the post. "Earth and Venus are nearing conjunction, and I want to be ready to take off as soon after that date as possible. I've no wish to hang around in space waiting for Earth to catch up to us with a cargo of weird specimens raising the devil in the hold. If you've no objections, Mr. Strike, we'll make our first foray at once."

Strike nodded, staring at this strange girl who could be one instant so warm and friendly, the next imperious and dominating as a queen.

"Sure," he agreed. "Be with you in a moment."

He ran up the metal stairway to where Roy Ransom's face hung over the porch rail like an amazed, bearded balloon, and the two vanished into the house. Strike returned shortly with a tiny two-way radio.

"Ransom sends out a radio beam for us to travel on; I tell him which way to turn it in case we deviate from a straight line. It's the only possible way to cover any distances in this murk." He adjusted a single earphone, slipped receiver and broadcaster unit into a capacious pocket.

Next he insisted on painting the insides of everyone's nostrils with a tarry, aromatic substance.

"Germ-killer," he smiled. "For each dangerous animal on this planet, there's a hundred vicious bacteria that will knock off an Earthman in twenty hours. I guess that finishes up the preliminaries. Shall we go? I ought to warn you that the sense of hearing is well developed up here, so it'll help if you move as quietly as possible."

"One moment." Gerry Carlyle's cool voice nailed Strike to the ground. "I want two things thoroughly understood. First, I'm the sole leader of this party, and what I say goes." She smiled with icy sweetness. "No complaints, of course, Mr. Strike, but it's just as well to forestall future misunderstandings. Secondly, you must know that the main object of this expedition is to catch one or more *Murris* and return with them alive. We'll take a number of other interesting specimens, of course, but the *Murri* is our real goal."

She looked around challengingly, as if expecting a strange reaction. She was not disappointed. Strike glanced up at the porch, exchanged a significant look with Ransom. He smiled wryly.

Gerry Carlyle's temper flared out momentarily.

"What's the mystery about this *Murri*, anyhow? Everywhere I go, on Venus, back on Earth among members of my own profession, if the word *Murri* is mentioned everyone immediately looks at the floor and scowls and tries to change the subject! Why?"

No one spoke. The Carlyle party shifted uneasily, their boots making sucking sounds. Presently Strike offered:

"The fact is, you'll never take back a *Murri* alive. But you wouldn't believe me if I told you the reason, Miss Carlyle. I—"

"Why not? What's the matter with 'em? Is their presence fatal to a human in some way?"

"Oh, no."

"Are they so rare or so shy they can't be found?"

"No, I think I can find you some before you take off."

"Then are they so delicate they can't stand the trip? If so, I can tell you we've done everything to make hold No. 3 an exact duplicate of living conditions here."

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"No, it isn't that, either," Strike sighed.

"Then what the devil is it?" she cried. "Why these evasions and secretive glances? You're acting just like Hank Rogers did when I caught him one day in the Explorers' Club. He came up here a while back to get a good *Murri* specimen. But he returned empty-handed. I asked him why, and he refused to tell me. Acted actually embarrassed about something. What's it all about?"

TOMMY Strike had no more stomach for feminine ridicule than the average man, so he shook his head firmly.

"It can't be explained, Miss Carlyle. It's just something you'll find out for yourself."

And on that electric note of dissatisfaction, the party struck off through the mist in search of the weird animal life of Venus. The half-dozen men from *The Ark* were surprised to find the going comparatively easy. Although the great amount of water on Venus would presuppose profuse jungle growth, there is insufficient sunlight to support much more than the tallest varieties of trees, which shoot hundreds of feet up into the curtain of the mist, their broad-bladed leaves spread wide to treasure every stray sunbeam that filters through.

Undergrowth, which is confined to a sprawling, cactuslike shrub with poisonous spines, and to a great many species of drably flowering plants with innumerable odors and perfumes, is laid out almost geometrically in order to catch the diluted sunshine without interference from the occasional lonely trees.

"The main danger in travel," as Strike explained, "is in losing the beam. Sometimes we have to circle a bog, and we've got to be pretty careful not to lose that radio beam."

The party, with Strike and Gerry Carlyle in the lead, hadn't been five minutes away from the station when the restless quiet was shattered by a terrific grunting and coughing, like the roar of a thousand hogs at feeding time. The noise was intermittent, rumbling for a few seconds with subsurface-car speed somewhere ahead, then stopping abruptly to be succeeded by slopping and smacking sounds.

The entire party was stricken in its tracks for an instant at the blast of strange thunder. Not from fear, because these people had met and bested nature's most terrifying forms all over the Solar System; but rather at the sudden unexpectedness of it, coming literally from out of nowhere.

Strike grinned.

"Shovel-mouth," he explained. "Not very dangerous."

Gerry Carlyle glanced tolerantly at her guide at the implication.

"We prefer 'em dangerous, as a matter of fact. Though I hardly expected to find anything interesting this close to—er— civilization."

Strike grinned at the thrust, and a little pringle of excitement crawled up his spine as he watched the Carlyle party slip into their smooth routine. The girl's crisp commands detailed one man to remain with the bulky equipment. Two more loaded a pair of cathode-bolt guns that looked like baby cannon beside the pistol Strike carried for emergencies.

Two of the others, including the girl, selected weapons that looked very much like the old-fashioned rifles, to be seen now only in museums, that fired lead or steel projectiles, except for a rather large bore and cumbersome breech. Barrows was to work the camera.

"Allen," Gerry snapped, "you circle around to the left. Kranz to the right. As usual, hold your fire unless it's absolutely necessary to prevent the specimen's escape. We'll give you three minutes to get into position."

The two flankers were already moving off into the mist when Strike woke up.

"Wait!" he cracked out. "Come back here. No one must get out of visual touch with me! It's too easy to get permanently lost. Sounds carry far, naturally, but it's impossible for an untrained ear to tell which direction they're coming from in this fog."

Gerry Carlyle's eyes flashed in momentary anger as her commands were countermanded, but the plan of

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action stood as amended to permit the two flankers to remain within sight of the main body.

STRIKE had thought that Miss Carlyle's assistants were rather a colorless lot, stooges automatically going through letter-perfect roles, and wondered if they'd be any good if they found themselves suddenly without a leader. But when the party spread out with military precision for the stalk, Tommy Strike had to admit to himself that he had never witnessed a more competent one. They were beautifully trained.

Not a single unnatural sound broke the quiet; not a stick snapped, not a fungus squelched beneath an incautious heel. Even the sucking noises from marshy spots were silenced. In sixty seconds they slipped into a little clearing and stood gazing with professional curiosity at the doomed shovel-mouth.

It was worth a second look. Fifty feet long and nearly twenty feet wide, it had three pairs of squat, powerful legs ending in enormously spatulate discs. Its hide was a thick, tough grey stuff that gleamed dully with a wet slickness in the half light. But the most surprising feature was the creature's head which, instead of tapering to a point, broadened into a mammoth snout that extended several feet horizontally from mouth-corner to mouth-corner. When placed to the ground it had a ludicrous similarity to the fan-tail vacuum cleaner attachment used to clean upholstered furniture.

The shovel-mouth stared at the party, uninterested, from out of muddy eyes, then lowered his head and waddled vigorously across the clearing, his mouth plowing up a wide, shallow furrow as he ate indiscriminately of the numerous fungi, low-lying bushes, sticks, and mud.

"Herbivorous," Strike murmured. "Main article of diet is fungus growths, but it takes so much for a meal that he has to spend most of his waking hours eating everything he can get his mouth on."

Evidently the animal had been at it some time, for the clearing looked as if a drunken farmer had been trying to plow it up. Gerry signaled, and her men moved into position like soldiers. She slipped up on the creature's blind side and aimed her curious rifle at the soft, inner portion of the shovel-mouth's leg. *Plop!* The beast jerked, nipped at the wound momentarily, then continued to feed. In twenty seconds it reeled dizzily about and fell to the ground, unconscious.

Just like that. Simple, efficient, no fuss at all. Tommy Strike felt a sense of anti-climax.

"What a disappointment," he said ruefully. "I expected a terrific battle and a lot of excitement with maybe one or two of us half killed for the sake of the movies!"

"With Mr. Strike heroically rescuing Gerry Carlyle from the jaws of death?" The girl smiled as Strike winced. "Sorry, but this is a business, Mr. Strike, and I find it pays to play safe and sane and preserve my men intact. I value them too much to risk their lives for the sake of a bunch of cheap-thrill seekers back home. No. We have excitement and adventure only when someone makes a mistake. Carlyle parties make a minimum of mistakes."

It was the arrogant and cocksure Gerry Carlyle speaking then, and Strike let it go. "I suppose you used a sort of hypodermic bullet in that rifle of yours. But I thought you'd be using more scientific weapons than that. It seems sort of — sort of primitive."

THE girl smiled.

"I know. You're wondering about the anaesthetic gases. Or the wonderful new paralysis ray. Well, there's a lot of inventions that work fine under controlled lab conditions that are flops in the field. The paralysis ray is just a toy, totally impracticable. It's unreliable because each different animal requires a different amount of the ray to subdue him, and we seldom have time to fool around experimenting in my work.

"It may also prove fatal if the victim gets too much of a jolt. As for knockout gas, it necessitates the hunters wearing masks, and it, too, is dif-

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ficult to control in the proper dosages, between unconsciousness and death."

Strike nodded understanding and turned to receive still another surprise. While he and the girl talked, the party had prepared the motionless shovel-mouth for transportation back to *The Ark*. Broad bands of bluish metal had been fastened around legs and neck, and the men had even managed to slide two or three underneath the huge body and encircle it.

Wires led from each piece of metal to a common source, a compact boxlike affair vaguely resembling a battery case with two dials on its face. A throw of a switch energized the metal, and gradually the mighty bulk of the shovel-mouth rose from the ground. It hung there in the air, suspended, like one of those grotesque toy balloons; to tow it back to the ship would be a simple matter.

"Anti-gravity!" said the girl with a theatrical flourish of the hand. "We give the metal bands a gravity charge of slightly more than one. Like charges repelling, they rise from the ground and carry the animal with them!"

The equipment-bearer simply lashed a rope round his waist to pull the shovel-mouth along behind, and the party resumed the hunt.

"I think," said Gerry Carlyle, "that we're too likely to bump into something in this mist unawares. If you'll bring out the electronic telescope, Mr. Barrows—"

Barrows at once produced one of the most interesting gadgets that Strike had yet seen, a portable model, of course, of the apparatus used on all the modern centrifugal flyers. It consisted of a power unit carried by one of the men, and a long glass tube to be carried by the observer. The front of it presented a convex surface covered with photoelectric material to the electron streams of all kinds of light, from ultra-violet to infra-red.

As the light particles entered the tube, they passed through a series of three electrostatic fields for focusing, and then through another field for magnification. At the rear of the tube they struck a fluorescent screen and reproduced the image. Looking through the baby telescope gave the impression of gazing down a tunnel in the mist for as far as the eye could reach.

By keeping in constant touch with Ransom at the post, who kept the beam moving slowly around like the spoke of a wheel, Strike enabled the party to move laterally. Through the telescope they picked up many of the smaller and shyer life-forms not ordinarily seen — lizards, crawling shapes, crablike forms, even two or three of the scaly man-things native to Venus, slithering silently through the fog with sulky expressions on their not-too-intelligent fishlike faces. Strike and Gerry became so interested in watching through the 'scope that it was nearly their undoing.

Without warning a rushing sound filled the air at their left, and a round grey ball rolled swiftly into view. It crossed their path dead ahead, propelling itself with dozens of stout cilia that sprouted indiscriminately from all sides, then paused abruptly. The miniature forest of arms waved delicately and exploringly in the air as if trying to locate the source of a new disturbance. Then the fantastic thing rushed unerringly at the Carlyle party.

ALL the hunters leaped agilely aside and let the juggernaut roll past. It stopped a few yards beyond with another waving of cilia, as if listening intently. Gerry pumped a hypodermic bullet at it, but the charge ripped glancingly off the armourlike lorica.

"Rotifer," said Strike shortly. "Something like the tiny animalcules back on Earth, magnified many times and adapted for land travel. Venus is largely aqueous and was even more so at one time. Much of its terrestrial life developed from life-forms originally dwelling in the water—" He stepped aside again, casually, as the rotifer rumbled by. "They have their uses, though. That half-hidden mouth of theirs takes in everything it contacts. They're the scavengers of this planet. We call 'em Venusian buzzards."

The party scattered for a third time as the blind devourer sought to catch

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them once more. Barrows looked appealingly at his leader.

"They may have their uses," admitted the sub-pilot, "but this baby'll be a damn' nuisance if we have to spend the rest of the trip dodging him!"

There was truth in that, so the rotifer was despatched with a cathode bolt. But as they crowded around to examine this curious bit of protoplasmic phenomena, a shrill scream racked their nerves from high up in the fog, as frightfully shocking as the shriek of a wounded horse. They swiveled about as a man to gaze upon the most terrifying of all products of Venusian vertebrate evolution.

Fully fifty feet the monster towered into the mist, standing upright on two massive legs reminiscent of the extinct terrestrial Tyrannosaurus rex. A set of short forelegs were equipped with hideously lethal claws; the head was long and narrow like a wolf's snout, with large ears and slavering fangs. Everything about the nightmare creature was constructed for efficient annihilation, particularly of those animals who mistakenly sought safety in the tops of the tall trees.

"A 'whip'!" yelled Strike, turning to the cathode-gun carriers, sudden apprehension stabbing him deep. "It's a whip! Let 'im have it, quick!"

The men looked uncertainly at Gerry Carlyle, who promptly countermanded the order.

"Not so fast. I want this one alive. They've nothing like him in London."

She flipped up her rifle, fired at a likely spot. Strike groaned as the monstrous whip squealed shrilly again and again, staring down at the tiny Earthlings from fiery little eyes. Then from that wolfish snout uncurled an amazing fifty-foot length of razor-edged tongue, like that of an Earthly ant-eater. Straight at Gerry Carlyle it lashed out, cracking sharply. Strike's rush caught the girl from behind and dumped her gently but quickly to the spongy earth.

"Curl up in a ball!" he yammered in her ear. "So he can't get any purchase with that tongue!"

Gerry obeyed, and Strike turned to warn the others as the whip swished over the girl's ducking head.

"Scatter!" he cried. "Don't—"

But too late. That coiling sweep of flesh rope struck Barrows glancingly across the head, shearing off the lobe of one ear. Blood spurted as the sub-pilot staggered away with one hand to his face.

The rest of the bearers darted alertly away in all directions, seeking the shelter of the fog. But the man who was burdened with the heavy equipment paused momentarily to shed himself of it. It cost him his life. Straight and sure that incredible tongue snaked out to wind itself around the man's twisting form. Like a catapult he shot into the air toward the gaping, fanged jaws.

THE fellow struggled, screaming like a madman. In vain. One arm was pinioned; he hadn't a chance to defend himself. Before his surprised companions could bring their guns to bear on the whip, there was a swift crunch, a hideous splattering of crimson stuff that looked bright and horrible against the drab background, and it was all over. The expeditionary force was reduced by one.

All possibility of rescue being gone, the reserve gunners lowered their deadly guns and allowed the hunters to go about the job of subduing the monster. Little snapping reports sounded in rapid succession, three, four, five. And presently the whip reeled like a huge building in an earthquake. Uncertainty racked the big body; it swayed. A few wavering steps described a short half circle. Then quietly it lay awkwardly down and passed into insensibility.

Strike clambered upright and pulled Gerry to her feet. He wiped cold sweat from his brow.

"Whew! That was too damn' close for comfort!"

The girl brushed herself off and stared Strike in the eye. "Hereafter, Mr. Strike, please remember that in a real emergency such as this one of our cardinal rules is every man for himself. The principle of throwing away two lives in a futile effort to save one is not encouraged among us. No more

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heroics, if you please!"

Strike's face flamed. No one likes to be bawled out when he's expecting warm gratitude. But even more Strike was angry at the apparent callousness.

"Then you don't think much of your assistants," he snapped, looking significantly at the bloody muzzle of the whip.

No emotion disturbed the serenity of the girl's face.

"On the contrary. I regret Blair's passing very much; he was a well-trained and valuable man. But he can be replaced."

"Good God, woman!" cried Strike. "Haven't you any feelings? A friend of yours has just been done to death horribly, on an alien planet, far from his home and family And you—" He stopped suddenly ashamed of his outburst of sentiment.

Gerry said simply, "We never sign on family men."

Then she turned her back to Strike and snapped orders to prepare the whip for transportation back to *The Ark*. But in the last tiny instant as she turned away, Strike glimpsed something in her eye that smote him speechless with its sudden and complete revelation. It explained at once and absolutely the reason for Gerry Carlyle's shell of impersonal reserve and callousness. She was a woman walking in a man's world, speaking men's language, using men's tools.

As a constant companion of men, she had to force herself to live their life, meet them on their own terms. To command their respect, she felt she had no right to use the natural endowments—her charm and beauty—that nature intended her to use for that purpose. Indeed, she dared not use them, for fear of the consequences. To give way to feminine emotion would be, she feared, to lose her domination over her male subordinates. She was, in short, that most pathetic of beings—a woman who dared not be a woman.

All this Tommy Strike learned and comprehended in a single glance. His feelings toward Gerry Carlyle began to change, from dislike to pity, and perhaps to something warmer. The thing he had seen was a woman's tear.

CHAPTER III

The Murris

THE succeeding days passed swiftly and adventurously. Specimen after weird specimen was subdued and carried to the rapidly filling hold of *The Ark*. The only fly in Strike's ointment was the ever-approaching hour when he must produce a *Murri* or face the wrath of Gerry Carlyle. And although he knew it was coming, still the demand came as a bit of a shock on the beginning of the sixth day.

"Mr. Strike." Not once had the girl dropped her shield of formality. "I've been pretty patient with your repeated side-tracking of my requests for a *Murri*. But our visit here's about over; we leave in forty-eight hours. To remain over during a Venusian night would mean a tiresome and dangerous journey home. Come on now. No more stalling."

Strike looked at the girl.

"What if I refused?"

Gerry smiled glacially. "Your company would hear about it at once. You were ordered to assist us in every way, you know."

Strike nodded, shrugged.

"All right. Just a second while I—"

The rest of his sentence was lost in a clatter of footsteps as Ransom came down the metal stairs with a curious piece of apparatus in his hands.

"Thought you'd be needing this, Tommy," he said significantly, with a disgusted glance at the girl.

"Yeah. I sure do." Strike fitted the contrivance to his body by shoulder straps.

"Now what?" Gerry wanted to know, "Do you need special equipment to find a *Murri?* What's that contraption for, anyhow?"

Strike adopted a professorial attitude.

"The power unit of this 'contraption' consists of a vacuum-tube oscillator and amplifier, and the receiver unit of an inductance bridge and vacuum-tube amplifier. There's also a set of headphones," he held them up in

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classroom style, "and an exploring coil. The bridge is energized by a sinusoidal current, brought to balance by appropriate resistance and inductance controls. If a conductive body comes within the artificially created magnetic field of the coil, eddy currents set up in the conductive mass will reduce the effective inductance of the exploring coil, serving to unbalance the bridge. This condition is indicated in the headphones—"

"Stop! Stop!" Gerry covered her ears with her hands. "I know an ore-finding doodle-bug when I see one! I just wanted to know why you're carrying it with you now."

"Oh. For protection."

"Protection against what?"

"The natives."

Gerry stared. "Natives! Those scaly, fish-faced rummies that skulk around just out of sight in the fog? Why, those timid little things wouldn't hurt us; they couldn't. Besides, how'll your doodle-bug protect us against them?"

"Why, they're very clever at hiding in the mist, and this metal indicator'll reveal their presence if they get too close. You see, all the natives in this sector wear gold teeth!"

Someone tittered, and Gerry flushed.

"If you please, Mr. Strike, let's stick to business and keep the conversation on an intellectual plane. A good joke has its place, but—"

"That's no joke," Strike said with a touch of bitterness. "It's a fact. Ever since Murray made his first trip to Venus, the natives have gone for gold teeth in a big way. They took Murray for a god, you know, and emulated him in many ways. He had several gold teeth, relics of childhood dentistry, so the natives promptly scraped up some of the cheaply impure gold that's found around here and made caps for their teeth. As for their not hurting us, Miss Carlyle, that remains to be seen. It has always meant trouble when one of you animal-catchers tries to mess around with the *Murris*. You'll understand me better in a few minutes." He shrugged with his eyebrows. "I'm just being prepared."

"RATS! Mystery, generalities, trouble! But no explanations! Your evasive hints of reasons not to touch the *Murris* just fascinate me all the more. I wouldn't drop the hunt now for all the radium on Callisto!"

"All right," Strike capitulated curtly. "Let's go." He struck off straight through the mist as if knowing exactly where he meant to go. In five minutes he halted before a mighty cycad peppered with twelve-inch holes which housed a colony of at least fifty of the famous *Murris*.

"There you are," said Strike with resignation. *"Pseudo-simia Murri."*

Gerry completely forgot to be indignant at Strike's holdout, as she was swept away in the gale of merriment that overcame the party at sight of the strange creatures. Perhaps half of the colony were in constant motion, scrambling round and round the huge bole of the tree, up and down, popping in and out of their holes, out along the mighty frondlike branches and back, frantically. The others simply sat watching in solemn indifference, occasionally opening their pouting lips to ask sorrowfully,

"Murri? Murri? Murri?"

They were well named. Though soft and greyish-brown, with scanty hair growth on their backs, their size and antics did resemble terrestrial simians. With their tremendous nasal development, they looked much like the Proboscis monkey. And this very de Bergerac beak of a nose made their name even more appropriate, for Sidney Murray, Stanhope's co-explorer, was famous throughout the System for having the hugest and ugliest nose extant. The *Pseudo-simia Murri* colony presented to the eyes of the fascinated watchers a hundred facial replicas of Sidney Murray spinning and dancing fantastically around the tree.

"Oh!" gasped Gerry finally, wiping laughter's tears from her cheeks. "Oh, but this is precious! Who—who named them?" She struggled mightily with a series of bubbling chuckles.

Strike looked lugubriously at her.

"Murray himself named 'em. He has quite a sense of humor."

"Sense of humor! Oh, it's colossal!" She took a deep breath. "What a sen-

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sation a dozen of these cute little butterballs will make in London! What a prize!"

"You haven't got 'em in London yet," Strike pointed out, keeping one uneasy eye on the indicator of his "doodle-bug."

"If you think anything's going to stop me now, you don't yet know Gerry Carlyle!" Again the arrogant, self-willed woman.

They moved up to the cycad and examined the *Murris* at closer quarters. They were quite tame. The close inspection revealed three facts of interest. The first was the presence of a short, prehensile tail equipped with a vicious-appearing sting near the tip.

"Only a weak defense mechanism," Strike explained it, "as *Murris* live almost exclusively on the datelike fruits of the tree they live in. The sting's no worse than a bee-sting." He extended one knotty forearm, showing a small pock-mark where he had once been stung.

The second was the large brown eyes possessed by the *Murri,* which stared at the intruders unblinkingly with a heart-wringing, hypnotic expression of sorrow.

"They look as if they'd seen all the trouble and woe in the Universe," as Barrows put it. "Makes me feel like a louse to take 'em away from their home!"

The third was a heap of strangely incongruous junk piled at the base of the big tree. There were cheap clocks, gewgaws, matches, children's fireworks, odds and ends.

"Offerings by the natives," explained Strike. "That's the legal tender up here; medicinal weeds and rough gems in exchange for—these things." He gestured at the pile of trash. "Anything fire-producing is especially valuable. The *Murri* is the native's god. Because of his resemblance to Sidney Murray, the First God."

THERE was more laughter, but subdued this time as the party realized that removing one or more *Murris* would be to commit Venusian sacrilege. "I see now what you meant by 'causing trouble'," Gerry said. "But it can't be too much for you to handle. It's happened before, I assume, and always blew over. These primitives—If that's your only reason for dissuading us to capture a few—"

"That's not the only reason." But Strike would explain no further.

"More mystery!" Gerry snorted, and supervised the set-up of a big net under one of the longer overhanging branches. Then two well-directed shots snapped the limb and catapulted a half dozen astonished *Murris* into the net. With incredible agility most of them bounced into the air and scrambled to safety. But one was caught in the tricky meshes. The ends of the net were quickly folded together to form a bag.

"Got him!" exulted Gerry. "Why, that was easy!"

"Sure. But he isn't in London Zoo yet, nor even back to the ship."

Gerry gave Strike a withering look, then peered into the net. The *Murri* lay quiescent, staring up with enormously round-eyed amazement.

"Murri-murri-murri?"

Gerry laughed again at this fantastic miniature of the great Murray, mumbling earnestly to himself. "Back to *The Ark,* boys," she cried. "We'll have a lot of fun with this little dickens!"

The party turned to retrace its steps, and then trouble broke out for fair. When the *Murri* had been removed about ten yards from its home tree, a violent fit of trembling seized him. He screamed shrilly two or three times, and from the *Murri* tree came a hideous shrieking clamor in response.

The little captive burst into a flurry of wild activity, struggling with unbelievable fury to escape. He twisted, clawed, spat, bit. As the carriers bore him inevitably further away from his home, he seemed to go absolutely mad, stinging himself repeatedly with barbed tail in an outburst of insane terror. After a series of heart-rending cries of despair, he gave a final frenzied outburst that ended with a gout of pale, straw-colored blood from his mouth.

The entire party stopped to stare appalled at the little creature. Gerry Carlyle's shell of reserve was punc-

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tured; she looked badly shaken. It was some moments before she could force herself to open the net and examine the quiet little body.

"Dead," she pronounced, though everyone knew it. "Internal hemorrhage. Burst a blood vessel."

Strike answered her bewildered glance with melancholy triumph.

"Agoraphobia. *Murris* are the most pronounced agoraphobes in the System. They spend their whole lives on and around the particular tree in which they're born. Take 'em a few yards away and they have a nervous breakdown ending in convulsions and death." He indicated the dead body in the net. "I could have told you, but you wouldn't have believed me. You'd have come to find out for yourself anyhow."

Gerry shook herself like a fluffy dog that has just received an unexpected ice-water shower.

"So that's what you meant when you said I'd never bring one back alive, is it?"

"Partly."

"Partly! You mean there's something else queer about these—"

Strike nodded gloomily.

"You'll find out before long. I know what you're going to do. Capture another. Cut off his tail so he can't sting himself. Tie him up like a Christmas package so he can't move hand or foot. Anything to keep him from killing himself by struggling. Right?"

"Right!" Gerry determined.

"Rogers tried all that when he was here, yet he failed."

"And so?"

Strike shrugged.

"So you'll fail, too. But don't let me stop—"

"You won't stop me, Mr. Strike. Don't ever think it!"

Together with Kranz, the girl rigged up two makeshift strait-jackets to hold the captive *Murris* rigidly unmoving. Meanwhile, the other hunters spread the big net again and shot down another branchful of the curious *Murris*. The healthiest pair were quickly strapped up tightly, and the party left to the accompaniment of a terrific yapping and hissing and yammering from the survivors of the colony.

Strike and Ransom spent the remainder of the lingering Venusian day resting from their exertions. Activity in that vicious climate quickly sapped the most rugged strength, and Strike particularly felt drained of all energy.

As the light imperceptibly faded, Ransom suggested, "I guess *The Ark* will be leaving soon. Now's the best time for 'em to take off. Conjunction."

[Turn Page]

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Strike shook his head.

"No. That tough little wench Carlyle is over there in her ship learning a mighty bitter lesson. She won't leave now; and she won't leave for some time," he predicted. "Wait and see." But only to himself did he admit the fingers of secret joy that squeezed his heart to breathlessness at the thought of seeing that incredible girl again.

CHAPTER IV

The Stolen Shrine

STRIKE was right. As the absolute darkness of Venusian night dragged its black cloak over the trading post, light footsteps ran up the stairs outside. Knuckles rapped on the metal door.

Ransom opened. There was still warmth in the thick air; it was almost pleasant at that hour. Gerry Carlyle pushed in.

"Mr. Strike," she said, and there was a worried crease between her eyes, "neither of the *Murris* will eat. We can't force anything down their throats. And if we free them, immediately they have one of those terrible fits!"

Strike shrugged. "So why come to me?"

"Can't you suggest anything to do? They'll starve themselves to death. And dead *Murris* have no market value. I've sworn I wouldn't return without at least one healthy *Murri*, so you've *got* to help me!"

"Nobody can do anything. You'll never take them back alive. I told you that before; presently you'll believe it. If there's any mercy in you, you'll return those two to their home while they're well."

Gerry's eyes flashed blue fire.

"I'm trying to be merciful without compromising my conscience! If humanly possible, I'm taking those *Murris* home alive! Now, if you'll only help— We're going to try feeding through a stomach tube. If that fails, with injections. I thought you'd be able to help us in the food selection."

"It's hopeless. Rogers tried that, too. When you take a *Murri* away from its home, he undergoes such a nervous shock that his metabolism goes completely haywire. He just can't assimilate anything."

Gerry went away furious, but was back within twenty-four hours. She was beginning to show the strain; her hair was awry, eyes bagged and bloodshot from lack of sleep. Her nerves were jumpy. "Strike," she begged, "can't you suggest anything? They're growing thinner by the hour! You can see them waste away! If you've been holding something back just to—to discipline me, I'll say 'uncle'. Only please—"

Strike seized the chance to turn the knife in the wound.

"You flatter yourself if you think I'd sacrifice even a couple of *Murris* for the sake of softening you a little."

But the thrust missed its mark. Gerry was lost within herself, absorbed in her battle to bend two insignificant caricatures to her will. "Damn them!" she flared. "They're doing this to spite me! But I'll make 'em live! I'll *make* 'em live!"

Forty-eight hours later she was back again, hanging frantically to Strike's sturdy arm. The *Murris'* silent martyrdom had broken her completely. She was a nervous wreck.

"Tommy," she wailed. "I can't stand it any longer! They just sit there, so helpless, so frail, without a sound, and *stare* at me. Those pathetic brown eyes follow me wherever I go. They—they're mesmerizing me. I see them in darkness; I see them in my dreams, when I manage to get to sleep. It's pitiful—and horrible. Even the crew goes around now with silent accusation in their faces. I can't stand it any longer!"

Strike's heart went out to this bewildered little girl, needing a man's comfort but not knowing how to get it.

"You see now why Rogers and the others wouldn't talk about their experience with the *Murris?* Why I said you wouldn't believe me even if I told you?"

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"Yes. I understand. Rogers was ashamed to admit what he thought was a weakness. Embarrassed to have anyone think a funny little Venusian monkey could soften him up by just staring at him with those hypnotic brown eyes." She shuddered. "I—I sent the boys out to find that tree and dig it up whole, *Murris* and all, to transport back to earth. I thought that might solve the difficulty. But I see now it wouldn't—"

"WHAT!" Strike roared in sudden apprehension. The fools! Not content with stealing away the natives' local gods, now they intended to desecrate the whole shrine! "Out there in the darkness? It's suicide!"

Strike leaped for his furs and heating pads, dressing quickly for a sortie into the bitter Venusian night. Gerry looked surprised.

"How do you mean? Are they in danger?"

"The natives have brought nothing here for trading in the last seventy hours," he returned grimly. "That means trouble. Plenty!"

"But surely they're not out at night! The temperature—"

"Doesn't affect them. They evolved from an aqueous life-form and like it cold. Fewer natural dangers for 'em at night, too."

He strapped on the gold-detector and radio receiver, strode for the door. "You stay here . . . Roy! Get the beam working!" He seized a light and barged out.

Gerry's mouth thinned out as she slipped her fur cape over her head and determinedly followed Strike down the stairway. There was a brief argument ending with Strike's angry capitulation.

"We can't debate it now. At least make yourself useful; carry this." He handed her the powerful searchlight, and they moved off together.

A new world was revealed in the gleaming swath of the light, everything covered with a thick frost, utterly lifeless and still. Each breath was a chill knife in their lungs. In the intense quiet they heard the faint sounds of the work party hard at the task of removing the *Murri* tree.

A quick run brought them to the clearing. Stationary lights made a ring about the workers, who had already fastened anti-gravity plates to the tree, and who were loosening the frozen soil. Strike's voice rang out through the thick plume of his breath.

"Stop work, men! Grab your tools and beat it back—" He paused. The needle on the detector's dial was jerking spasmodically.

"Quick!" yelled Strike. "The natives are close by! Run for it!"

But the work party, blinded by the lights, gaped stupidly about and called out questions. Strike ran at them, furiously shouting, but the words were jammed in his teeth as he witnessed an incredible sight. One by one the members of the digging party were falling, wriggling and twisting amazingly.

One of them thrust his feet straight into the air and made grotesque walking motions. Another dug his face into the dirt trying to walk right down through the earth. The only one remaining upright turned round and round in tight little circles like a pirouetting ice-skater.

"Good heavens!" cried Gerry unsteadily. "What's wrong with them?"

Strike seized her about the waist. "Gas! Don't breathe! The natives get it from one of these devilish Venusian plants. Gets into the nervous system. Localizes in the semi-circular canals. Destroys the sense of balance!" He started back through the mist toward the station.

But with the third step Strike's world reeled sickeningly about him. He dropped the girl, fighting desperately with outstretched arms for balance. The ground heaved beneath him. Wherever he strove to put his feet, it seemed successively to be the sky, the perpendicular bole of a tree, nothingness.

His eyes began to throb intolerably. Terrible nausea shook him, and he retched violently several times. He thrashed about so wildly in his efforts to stand upright that his equipment was scattered helter-skelter about the clearing, much of it smashed.

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STRIKE forced himself to lie quietly while the visible world rocked like a storm-lashed ship. He was conscious of the frightened yells of the stricken workmen, a rush of feet, the monosyllabic squeaks and rasps of the Venusians whose gill-like breathing system filtered out all the poisonous elements of the atmosphere. Then Gerry's startled scream knifed his consciousness. Just one outcry, no more; Gerry's pride would permit no begging for help. But the sounds of her aimless struggling were plain as she was carried away.

Strike sat up. His smarting eyes took in a confused blur of moving figures. The man who had been standing was down now, a literal pin-cushion bristling with poison-dipped native spears. Already the body was bloating. None of the others, apparently, were injured. Then the horrid vomiting welled up in Strike's throat, and he rolled over to be sick again.

But Strike, on the extreme edge of the clearing, had inhaled only a little of the gas. He lay with his face close to the frozen earth, breathing cautiously, testing every lungful for telltale odors, then exhaling vigorously. Gradually the earth slowed its spinning as the stuff worked off. Strike became conscious of a splitting headache, as if every nerve-ending in his skull was raw and throbbing. But as he took in the scene before him, all thought of his own discomfort vanished in the wave of horror that swept over him.

The natives were out for revenge, and golden-haired Gerry Carlyle was the intended victim!

Strike had underestimated the natives' intelligence. Smarter than he had thought, they recognized somehow in the anti-gravity plates fastened to the tree trunk the greatest threat to the *Murris*. Further, their sluggish wits had puzzled out cause and effect, and had gone unerringly to the control unit with its deadly switch, ready to unleash its incalculable power with the touch of a finger.

Gerry lay in a limp bundle on the ground, jerking now and then. About her slim body were clumsily fixed at least a half dozen of the anti-gravity plates. And the leader of the Venusians was bending over the switch.

Strike started up in a frenzy, yelling. Rubbery knees promptly sent him to the ground again. Not yet. No strength. He whispered a prayer for something to delay that outstretched native finger hovering over the power unit. Perhaps he would move it the wrong way, and— But Strike went cold all over at the thought. He wasn't sure, but wouldn't that smash Gerry into a bloody pulp, grind her into a shapeless mess against the earth?

Strike began to crawl grimly toward the lighted circle and the pile of weapons belonging to the disarmed work party. It was far, too far. He'd never make it. He paused to be sick again, less violently this time. His head was clearing rapidly, but too late. He had to delay things, somehow.

Strike's hand bumped against his pocket, dipped in and swiftly out again holding his pipe. Still half full of tobacco. He snatched out a lighter and applied the flame, sucking vigorously, fighting the giddiness, blowing great clouds of pungent smoke all about him. The pipe dropped from nerveless fingers, and he hunched down in a prayerful attitude, hoping, waiting tensely. Had he failed?

Zin-n-ng! Plock! It worked! Strike ducked and curled up into as small a ball as possible. In a split second the air resounded with the shrill whines of hundreds of the tiny whiz-bang beetles, armor-protected against the cold, as they hurtled in a cloud to the source of their favorite scent. Few flew low enough to hit Strike, and those were glancing blows that simply left red welts across his back. He saw perfectly the entire scene as his unwitting allies, the whiz-bangs, stormed into the clearing.

IT was as if someone had loosed a series of shotgun charges at the natives. The leader of the Venusians dropped as if cathoded when several of the armored beetles rifled into his most vulnerable spot, the throat. The night rattled with the sodden plunk-

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ing of living projectiles into scaly flesh. The natives set up a hideous, thin wailing. They ducked; they flailed about them with vigorous futility. And finally they broke and ran wildly away into the dark, dropping even their weapons in their flight.

For a while the whiz-bangs zoomed back and forth across the clearing, but eventually they, too, vanished as Strike's now-buried pipe gave forth no more enticing scents. Presently Strike stood up, brushed himself off, and grinned. This was his moment! Like a conquering hero he strode into the clearing to gaze on the devastation that had been wrought.

The workmen were still prone, sensibly waiting for the effects of the gas to wear off. Gerry leaned like an old rag against the tree, staring with dazed, frightened eyes at her deliverer. Her fingers trembled so that Strike had to help her unfasten the anti-gravity plates.

She tried to stand erect, but her knees betrayed her and she fell into Strike's ready embrace. He tried to look stern.

"Well, young lady, I trust you've learned two lessons this night. One, that even a Gerry Carlyle can't always have her way. Especially with the *Murris*. Two, that a mere man, even if only to make an occasional unwanted sacrifice, can sometimes come in pretty handy!"

Gerry Carlyle became acutely conscious of her position and she tried to free herself, with no great earnestness. Strike laughed. She turned a furious crimson, and he laughed at her again.

"Simply a vaso-motor disturbance," she explained frigidly.

"Is that what you call it? I rather like it. I want to see more." Strike kissed her, and Gerry's vaso-motor system went completely haywire.

From far up in the invisible branches of the *Murri*-tree, one of its inhabitants, disturbed by the night's hullabaloo, leaned out and inquired sleepily through his nose:

"Murri? Murri-murri-murri?"

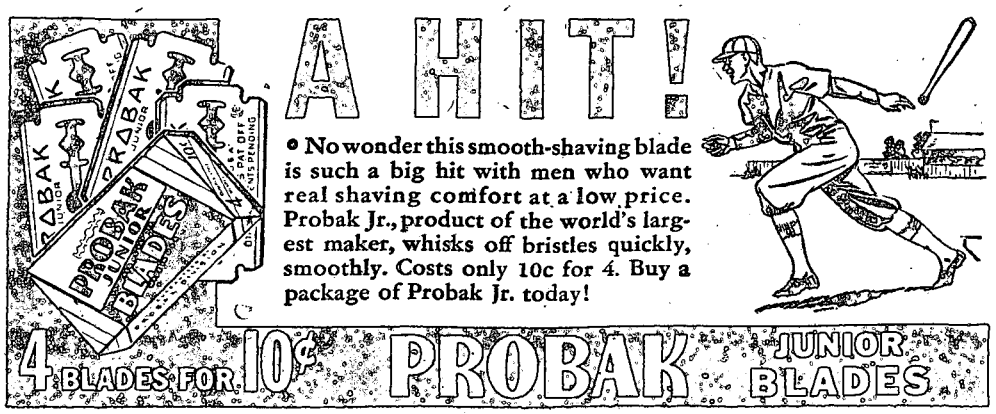
IN THE NEXT ISSUE

A MONTH A MINUTE

A Novelette of Time and Space

By RALPH MILNE FARLEY

—AND MANY OTHER UNUSUAL NOVELETTES AND STORIES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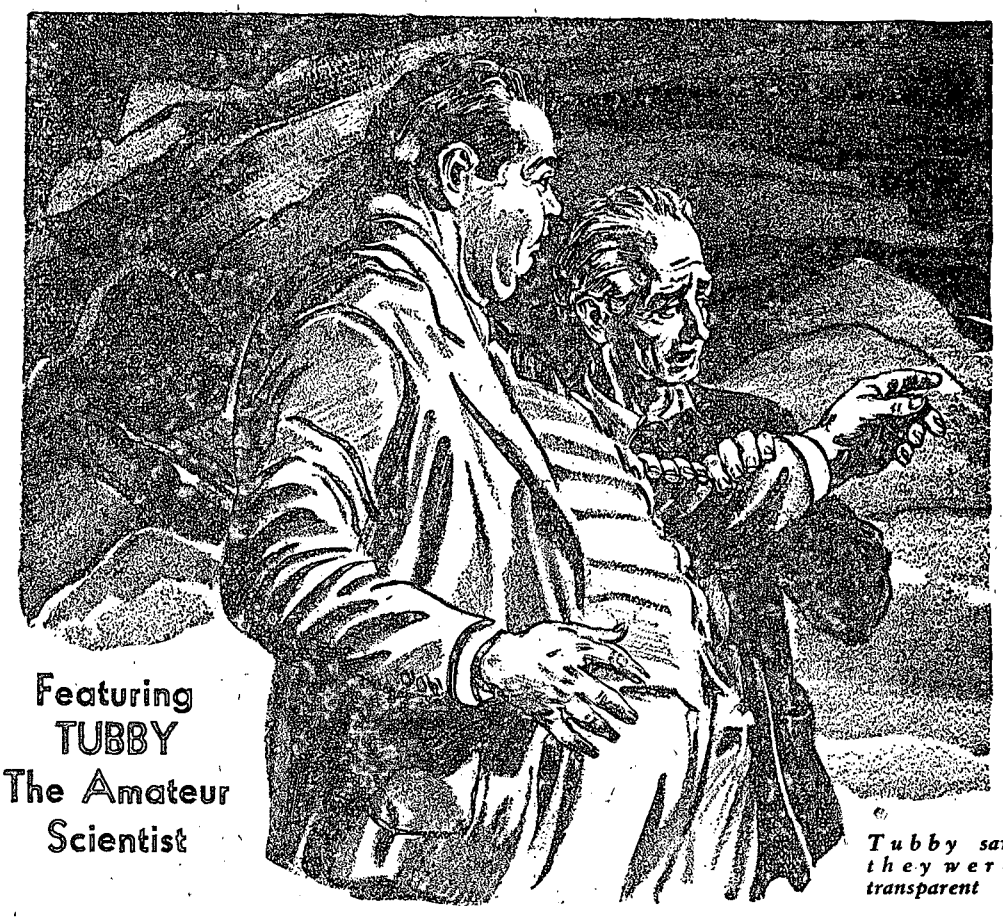
The SPACE—TIME—



Featuring
TUBBY
The Amateur
Scientist

Tubby saw they were transparent

TUBBY sat with his hands folded on his bulging middle, listening to the learned professor who was haranguing an intent little audience from his place on the rostrum.

"A light-year," the professor was saying, "is the astronomical unit of distance. It is the distance light travels in a year—roughly 186,000 miles a second, multiplied by 31,557,600, which is the number of seconds in a year. That gives a total of—"

The man beside Tubby twitched at his arm.

"Tubby, what's he talkin' about?"

"Shut up," Tubby whispered fiercely.

"You're right," murmured the man another seat beyond. "How can he get educated when he won't stay shut up?"

"—and that's a light-year," the professor was saying.

"But how's he know that?" the first man murmured. "I ast you, Tubby, how's he *know*—"

"Shut up," Tubby repeated. "Perfessors know everything."

"Sir Isaac Newton," the professor was saying, "developed a very ingenious theory of the mathematical laws that govern our Universe. But now we have Albert Einstein. The Newtonian theories are outmoded. The modern concepts of Albert Einstein, in his basic postulates upon which are

Sir Isaac Verne Discovers the World of

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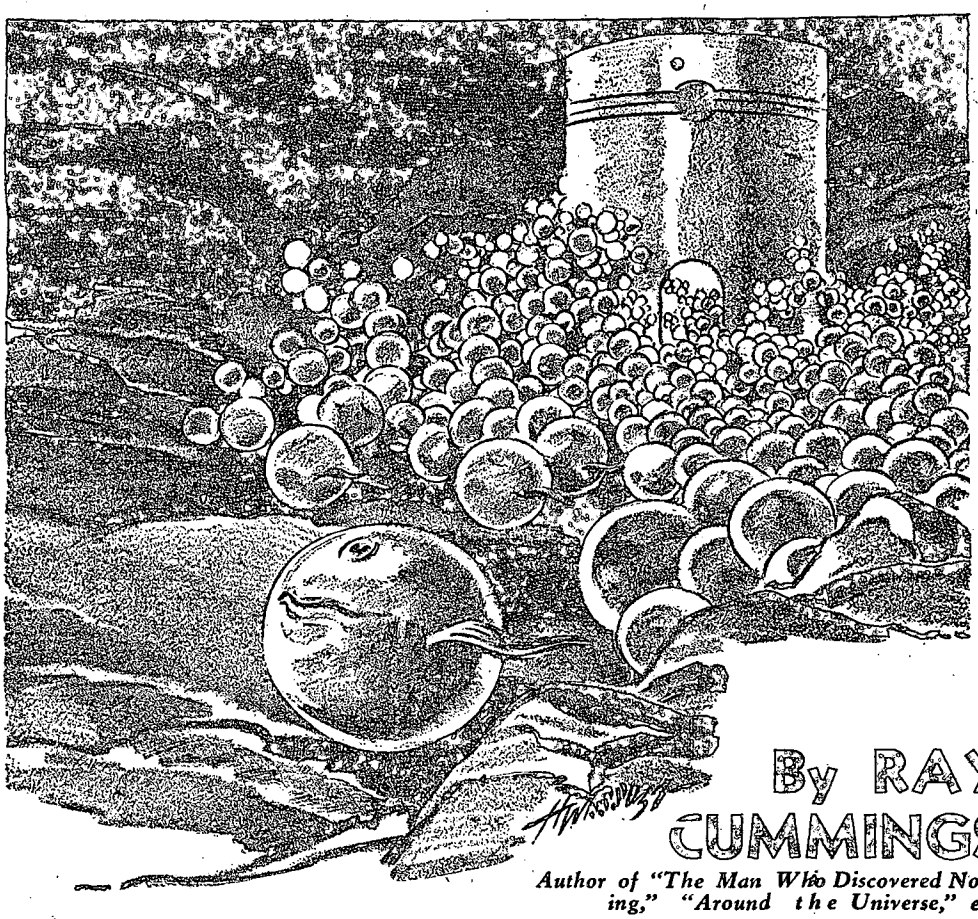
SIZE MACHINE



By RAY CUMMINGS

Author of "The Man Who Discovered Nothing," "Around the Universe," etc.

built his general and special theories of relativity—"

The professor's voice droned on. Tubby sat listening carefully. He was a little sorry that he had eaten so many olives for dinner. He pressed his folded hands more tightly upon the region where the olives now were rolling, like a game of marbles, bumping each other. Sir Isaac Newton discovered the laws of gravity . . . that attraction varies inversely as the square of the light-years. No, that was wrong. Newton was a dead-head anyway, because Einstein now had a new theory—

Abruptly Tubby felt a hand prodding at the back of his neck. He swung around.

"Hey, quit that," he protested.

The lecture hall was so dark Tubby could hardly see the man behind him.

"I'm sorry," the man whispered. "I didn't want to annoy you. If you'll come outside just a minute—it's very important."

They both had aisle seats. The man stood up, pulling gently at Tubby's arm. Tubby saw now that he was a very small, thin man in a black alpaca suit.

"I do wish you'd come," he added. His voice was horribly sad; his enormous Adam's apple bobbed up and down in his scrawny throat which was

Delayed Sound—With Sound Effects!

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encircled by a soft collar and flowing tie.

"You're in trouble?" Tubby murmured. He shoved himself pantingly into the aisle. They went to the door.

"My feelings are hurt," the man was whispering. "You heard what he said —Sir Isaac outmoded—"

They stood in a little entrance. The light disclosed the stranger now. Tubby thought he had never seen so tragic a face before. It was long and very thin. A wisp of scragged brown-white hair was above it.

Tubby felt sympathetic.

"You're feelings are hurt? That's too bad—"

"I knew you'd console me," the stranger said. He brightened at once. "That's why I wanted you to come with me."

His big sad eyes were trying to smile. He was a pathetic little fellow. Beside him, Tubby's two hundred pounds of bulk loomed stalwart and comforting.

"Cheer up," Tubby said. "Ain't no use crying. Where we goin'? What's your name?"

"Sir Isaac," the stranger said. "Sir Isaac Newton Wells Verne." He paused, with a gentle sad dignity.

"Oh," said Tubby. "Pleased to meet you."

"So you see," Sir Isaac said, "why my feelings are hurt. There was a time, not so many years ago, when people realized that I knew all about everything." His bony hand gestured deprecatingly. "Everything about science, I mean. My theories of the laws of gravity—my books describing strange adventures in space—visits to the moon—Have you ever read my book, 'The First Men in the Moon'?"

"I ain't read it but I heard of it," Tubby said.

SIR ISAAC's sad face was wanly smiling.

"Of course you have. *That* was astronomical. And then I wrote another book—'Twenty Thousand Leagues Under the Sea'—that explained the wonders of our own oceans. And I wrote—"

"I heard of it," Tubby said. "You ain't got no cause to be sad, Perfessor."

"No. I realize that." Sir Isaac's little figure straightened. "You're very comforting. I *knew* you would be." His sad eyes were darting fire now. "But when I think of what I have done for the advancement of science—and this fellow Einstein comes and tries to take the credit away from me—it just makes me boil over with anger."

"Me too," Tubby agreed. "Don't let's stand it, Perfessor. Did you say we was goin' somewhere?"

"On a long journey," Sir Isaac said. "I knew you'd want to help me. I don't want to go alone—I can't manage things."

"An' I can," Tubby said. "That's fine."

"I'm going to gather material for my next book," Sir Isaac explained. They had left the lecture hall now and were walking rapidly along a dim street. "I'll show this Albert Einstein that *I'm* the one who knows all about everything—"

"Sure," Tubby panted. "We'll show him we're the ones who knows all about everything. Don't walk so fast, Perfessor. You got me all out of breath."

"Here's my vehicle," Sir Isaac said abruptly.

The thing stood behind a fence in the middle of an empty lot. It was a big, white cylindrical object the size of a small house.

"My space-time-size vehicle," Sir Isaac added proudly as they approached.

Tubby gazed at it with awe.

"What's it do, Perfessor?"

"Everything," Sir Isaac said. "It is the perfect vehicle. I invented it. I'm going to tell the world about it in at least a dozen books, when we get back from this trip."

"To where, Perfessor?"

There was awe in Sir Isaac's voice as he spoke.

"We are going," he said, "up through size gigantic, through vast eras of future time to the end of space."

Tubby pondered it.

"Seems like quite a trip, Perfessor."

They had passed through a doorslide and were in a dim glowing room of the vehicle. Tubby saw intricate banks of dials and levers, a perfect maze of instruments. The ship certainly seemed ready to start. Tubby could feel the floor vibrating, and he heard the low throb of the idling mechanisms.

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"It is indeed quite a trip," Sir Isaac agreed. "But it won't take us long—I mean, the time-distance will be billions and billions of years, but it won't seem long to us."

"Well, that's good," Tubby commented. He told himself this place didn't look very comfortable for a long journey, but there was no use hurting Sir Isaac's feelings by saying so.

Sir Isaac gestured.

"You sit here by this glassite bull's-eye, so you can see everything."

He locked the door. Tubby gripped the metal handles of his chair as Sir Isaac rapidly pressed and twirled a sequence of little buttons and dials.

Tubby felt a shock; a queer sense of lightness in his head as though he had just had several drinks in rapid succession. Then the feeling passed. He found Sir Isaac standing over him. "You're all right?"

"I—I ain't sure, but I guess so," Tubby gasped.

Sir Isaac looked relieved.

"Things sometimes go wrong," he admitted. "We're started now. I won't describe all the intricate wonders of my apparatus—you'll find all that sort of thing in my books. But I will tell you that I have gravity and anti-gravity plates to propel us through space—"

HE was suddenly talking very fast and glibly.

"And inside my vehicle here I maintain normal Earth-gravity always. Also normal air-pressure of 16.1 pounds per square inch—temperature 70° Fahrenheit. Our air is renewed by the Reiset and Regnaut system of producing oxygen from chlorate of potassium and the removal of carbonic acid gas with chlorate of potash. I consider it the best system of its kind. It ought to be. *I* invented it. I've written about it a lot."

"Oh," said Tubby.

He was staring through the window. The empty lot seemed to have vanished; there was nothing in sight but stars.

"Are we pretty high up already?" Tubby asked. "Where's the ground?"

"Don't be silly," Sir Isaac reproved. He consulted seven or eight of the whirling dials. "Relative to Earth-dimensions, we have now gone 8,563,002 miles. Earth miles, that is." Again his words were coming with a smooth, glib rush. "In time, we have passed through 782 centuries. And in size we are growing gigantic. We are now—at this exact instant—" He peered closely at a rigid dial. "We are now 968 times our original size. Of course the rate of change is in geometrical progression. Wait—" He consulted the dial again. "It's now 1936 times—just double, you see. It will be four times that in a few seconds more."

He paused, panting slightly from lack of breath.

"We're gettin' pretty big, ain't we, Perfessor?" Tubby ventured, after another silence. "Am I right?"

"You are indeed," Sir Isaac agreed beamingly. "But our change so far in space-time-size is infinitesimal compared to what is coming. Now—there you can see the Solar System nicely. It's just come into view as I swung our course. We've gone now quite a little distance—by Earth-dimensions, millions and millions of miles."

Tubby bent closer to the window. Up and down and sideward there was nothing but a black velvet sky studded with stars that were pin-points of light.

"Solar System?" he murmured.

"Yes. Our sun with its little group of planets—Earth, Mars, Venus and so on. See it?"

Tubby made it out at last. The sun was the brightest star; Earth was green and Mars was reddish; Saturn was iridescent, with a ring like a hat-brim. And as he stared, the tiny cluster was dwindling, getting further away—

Then he gasped, "Say, Perfessor—it don't look so far away at that. It just looks small."

His viewpoint quite suddenly had changed. The vehicle floating in the void—with Sir Isaac and himself in it—now seemed gigantic, surrounded by tiny worlds, not very far away. It was as though, half a mile from where they were, the sun, Earth and the rest of them were actually no bigger than peas.

"Quite right," Sir Isaac agreed. "We're growing so fast we can't ever get far away from them. We have to move fast through space or we wouldn't have enough room." He sighed. "It's

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so crowded in here—when we get beyond the Milky Way things are more open. There's Alpha Centauri. It's one of the very closest stars to our Earth, only about 25,000,000,000,000 miles away—4.35 light-years, to be exact. We'll be above and beyond it presently."

Tubby stared. Now he could see movement to the scene. The whole vast abyss and all the pinpoints of light were dwindling, shrinking together with a crawling motion.

SIR ISAAC explained it.

"Our size-change causes most of it—"

"As we get bigger, everything else looks smaller," Tubby interrupted. "Am I right?"

"Yes," Sir Isaac nodded. "And our time-change—a thousand Earth-years, it's only a second of time to us now. Look at that binary—those two stars rotating around each other—rotating around a common center of gravity. With time speeded up this way, you can see them spinning like two balls on the end of a string."

Tubby saw them, but they were swept away into smallness in a moment. What an amazing motion was everywhere to be seen now! Star clusters, spiral nebulae, came whirling forward; passed to the sides of the ship and were gone. Great universes of worlds, like clouds of luminous star-dust, approached and shrank and dwindled to a puff of cigarette smoke to vanish into nothingness.

Then all at once it seemed as though no more stars were ahead. Behind and under the window, all the specks were congealing into one cloud. And it didn't seem to recede—just to dwindle.

Tubby took a long breath.

"Well," he murmured, "that was excitin' while it lasted. An' now what, Perfessor?"

Sir Isaac leaned toward him.

"The time has come," he said, "when I must tell you my big secret. That man Albert Einstein—" Sir Isaac's eyes flashed.

"He's out," Tubby said. "Am I right or ain't I?"

"Correct. We'll forget him. He has theories, I deal in facts."

"Your big secret," Tubby prompted.

"The real nature of space," Sir Isaac said. "Do you know what an atom is?"

Tubby gulped. "It ain't somethin' very big—am I right?"

"It's a particle of matter, consisting of a void, with other particles whirling in it—electrons and such. And this void we're in now—" Sir Isaac gestured to the empty darkness outside the window. "Do you know what it really is?"

"Maybe I don't," Tubby admitted. "You tell me."

"It's the interior of an atom—a tiny particle of matter of a gigantic outer world."

"You mean, like a grain of sand lyin' on a beach, an' we're in the grain of sand. Am I wrong?"

Sir Isaac beamed and clapped him on the shoulder. "You're never wrong. You put it to a T. I must remember that analogy, when I come to explain it in my next book. Don't you see how nicely everything fits? This void of space on Earth seems gigantic, illimitable, because we're so small on tiny Earth. The earth and all the stars are nothing but electrons, flashing around each other. It takes a year for Earth to make one circuit around our sun. But that's Earth-time. To the time of this gigantic world, the electron-earth would flash around that orbit thousands of times a second. You understand me?"

"Maybe," Tubby agreed.

"And we've been growing gigantic," Sir Isaac went on. "Compared to us the void is shrinking. It's only a tiny thing, really, enclosed by the inner surface of the atom—"

"The big grain of sand," Tubby said.

Sir Isaac nodded eagerly. "And now, right this instant, we must be nearing that inner surface. And do you know what I really believe?"

"No," Tubby murmured breathlessly. "What?"

"I believe we're going to find people living there. Rational humans like ourselves. People of the atom. Dear me—that reminds me of a book I once wrote—"

HE CHECKED himself suddenly. Upon his thin, flushed, earnest face came a look of horror.

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"W—what's the matter?" Tubby stammered.

"The warning signal from my electro-spectro-ultradynometer! We're approaching the inner surface now! Too close for safety with all this space-time-size change going on! Why—"

He sprang tremblingly to his feet. For just a second he stood undecided; then he ran frantically around the control room, pulling levers, pressing buttons, shoving switches and peering at dials. Tubby clung to his chair with his head reeling. Then the panting Sir Isaac was bending beside him.

"Gave me a scare—thought we were going to crash . . . There's the surface! Lights! That means people! I'm vindicated! What a wonderful book this will make!"

Tubby had a brief vision of an upsrushing darkly glowing surface—tiny moving lights—a shimmering blob that looked like an iridescent lake. Then the ship was vibrating and there was a crashing thud. The lights in the control room were extinguished.

"We're here," Sir Isaac cried exultantly.

Tubby staggered to his feet.

"Quite a bump, but we're here."

Sir Isaac slid open the pressure door. Heavy warm air wafted in. At the doorway, breathless with emotion, Sir Isaac and Tubby stood peering at a desolate scene of empty, naked, glowing rocks.

"Quite some difference from Earth. Am I right, Perfessor?"

It was different indeed. Sir Isaac saw and understood the differences, but to Tubby it was horribly confusing. Never in his life had he seen so many confusing things in a landscape. Whether it was night here, or day, he could not tell. There were no stars overhead—just an empty black sky. The light was like twilight; but it didn't come from the air. The rocks themselves seemed self-luminous, phosphorescent.

"Inherent to the molecules of the rocks," Sir Isaac murmured. "That's as it should be—I recall my golden atom had that quality."

It was a barren, grim landscape—stripped of vegetation, just a vista of tumbled blue-black crags, dwindling off into a blurred luminous distance. Tubby stared, puzzled.

"Perfessor, listen—there's something wrong about this, am I right?"

"Clever fellow," Sir Isaac agreed warmly. "You notice the fundamental difference at once. Earth is a convex surface. This is concave."

Patiently he explained it. This was the inner surface of a gigantic atom, just the opposite from the outer surface of Earth. The landscape here curved upward to the horizon. Tubby saw it now plainly—a rising curve up to where in the vague glowing distance there was a blur of mountains.

Sir Isaac was enthusiastic.

"It confirms my theory absolutely. You notice, the angle of curvature is much greater than on Earth. I would say, relative to our present size, this inner surface is no more than some 6000 miles in circumference. So that would make a diameter of some 2000 miles. Think of it—all that we on Earth call the infinity of space has dwindled now to 2000 miles."

Sir Isaac was so pleased with himself that Tubby couldn't resist the temptation to take him down a peg.

"You said there was people here, Perfessor. I don't see none."

Sir Isaac was crestfallen. He took a step out of the doorway, with Tubby standing beside him on the blue-black phosphorescent rock-surface. Everything was so queer here. Even the atmosphere seemed different from that of the earths. Tubby found himself panting, as though somehow this heavy air wasn't doing his lungs any good.

"NO PEOPLE," Sir Isaac said at last. "That would be a horrible disappointment. I could have sworn I saw moving lights as we landed."

"Listen," Tubby warned. "I hear somethin'."

They had been absorbed in their argument. Now they became aware of a distant chattering sound, a murmuring noise like a thousand tiny voices all mixed together.

"Queer," Sir Isaac said. "That lake over there—"

About five hundred feet away there was a patch of what seemed phosphorescent water. Tubby's and Sir Isaac's eyes were becoming more accustomed

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to the dim light; details were getting clearer. Tubby could see the little patch of water much better now. He blinked, puzzled. Certainly it was the queerest lake he had ever beheld. The water was all churned up as though tumbled with waves. But there was not the slightest wind blowing. And Tubby saw that in the lake hundreds of tiny lights seemed bobbing around. The chattering tiny voices came from there.

And queerest of all, this weird lake had no banks! The water wasn't sunk in the ground; it was all heaped up on top of the ground, with nothing to hold it from flowing away!

"There's something wrong," Tubby muttered. "Am I right?"

"I have it!" Sir Isaac exclaimed suddenly. "Stupid of me! That isn't water! That isn't a lake! That's a crowd of people huddled together—frightened of us!"

He took a few steps forward, with Tubby close beside him.

"People?" Tubby murmured.

"We won't hurt you," Sir Isaac called. "Come forward! Stop crowding together—let's see what you look like."

The murmuring distant chatter didn't change.

"Queer! Can't they hear me?" Sir Isaac murmured.

"Maybe they don't understand English," Tubby suggested.

Then suddenly the distant murmur did change. All the little chattering cries were stilled, and out of the silence came a muffled voice:

"Who—are—you?"

"English!" Tubby exclaimed. "Good luck for us, Perfessor."

"It would have to be English," Sir Isaac said. "I mean, naturally it would sound like English to us. That's telepathy. The meaning of their speech impresses our brains so that we translate it with words familiar to us. Those strange beings are doing the same—I mean they think they are hearing us in their own language. Good heavens, look at them!"

The patch of what had seemed water was breaking apart now. Little round things, a foot or two in size, were shifting apart, rolling and bouncing so that in a minute to left and right the rocks were jammed. Amazing little things. A thousand of them at least, each with a tiny winking light like an eye.

"We're friends from Earth," Sir Isaac called. "Have your leader come forward. We won't hurt you."

TUBBY stammered softly, "Them's people? My Gawd, Perfessor—I never seen anything like them before."

"Of course you haven't. They are indigenous to this realm, a different basic protoplasm from ourselves, different environment, a wholly different plane of evolution. By the look of them I would say that the molecular structure of the protoplasm is less dense, less cohesive—more in the nature of what we call the liquid state—I'll write a book on the subject when we—"

"Here comes one," Tubby interrupted with awe. "My Gawd, look at him."

As though Sir Isaac's previous command had just been understood, a seeming leader had detached himself from the throng. He was larger than most of them—an almost perfectly round ball nearly as tall as Tubby's knees. He came bouncing, undulating by flattening himself, and then expanding so that he bounced, balancing himself with tiny arms like flippers. Then he stood still about a hundred feet away. He seemed panting.

"He's all tired out," Tubby said. "Tough going, eh, Perfessor."

They could see him much plainer now. The jellylike, dead-white membrane of his globular body was heaving in and out, and the whole of him was trembling. The little eye was on top, in front. It winked on and off, faint and greenish, like a glow-worm. It illumined what might be the face—a palpitating slit like a vertical mouth was over it. The slit opened and closed as though words were coming, but no sound was audible.

Tubby saw that the palpitating body was dimly transparent. The organs were visible, crowded inside — all quivering and shifting one upon the other.

"The semi-liquid state," Sir Isaac was murmuring as though to himself. "I mustn't forget the details: original protoplasmic cell-structure of light atomic weight—a multiplicity of atoms

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loosely bound into molecules. Naturally, like liquids on our Earth, the conglomeration of cells assumes a globular shape when in a state of rest. A brain at the top, visibly apparent—small, but of intricate fluid structure. Internal organs of unknown nature. Food must be inhaled from the air; there are tiny floating unicellular organisms to provide nourishment, for certainly there seems no vegetable life here. . . . This being has a voice—a vocal organ—"

"Who—do—you—say—you — are?" The weird little voice suddenly sounded like tiny words popping out of a gun. But queerly enough, though the slit of mouth had seemed to be talking half a minute ago, it was tightly closed now.

"We come on a tour of exploration from Earth," Sir Isaac called back.

The words floated away into silence, and nothing else happened. All the thousands of little balls stood with rapt attention. The leader seemed waiting. Then at last his mouth opened and closed rapidly. But no sound came.

Then after another long interval, the words arrived:

"From—which—Earth? Don't—you —know — there — are — myriads of Earths?"

"Somethin' queer about this," Tubby muttered.

"I have it," Sir Isaac exclaimed. "Delayed sound. Why didn't I think of that before! Naturally with so strange an environment—this different type of air—molecules moving slowly, sluggishly vibrating — transmitting the waves of sound at a much slower rate than on Earth—"

"Delayed sound? What you mean, Perfessor?"

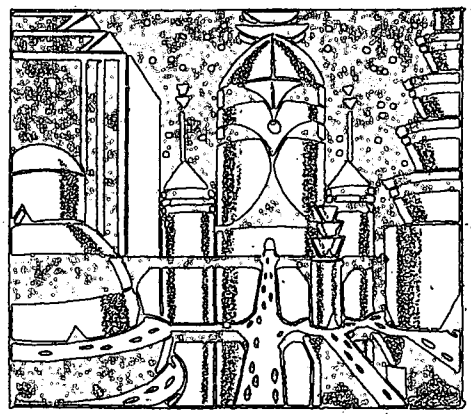
"Wait," Sir Isaac said. "I'll get an answer on its way to him."

"We come from the Solar System," he called.

"Sound travels very slowly here," he added to Tubby. "On Earth it's approximately 1050 feet a second. Here, I should judge it is only about a hundredth that fast . . . Maybe less . . .

WHAT IS YOUR SCIENCE KNOWLEDGE

Test Yourself by This Questionnaire



1—How long is the Venusian day?

2—How many light years away is the star, Alpha Centauri, from the earth?

3—So far as weight per horsepower goes, which is more efficient, a muscle or a gas engine?

4—What is a hypersphere?

5—What are the names of the two moons of Mars?

6—What is a comet?

7—What elements are contained in the tail of a comet?

8—How often does Halley's comet return to Earth?

9—What famous scientist theorized that life spores can travel from world to world in the cold of space?

(A Guide to the Answers Will Be Found on Page 123)

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Look, he just heard me. He doesn't realize this is abnormal, of course. It's perfectly normal to him. Look—now he's answering."

THE mouth was going again. And presently the words arrived:

"Which — Solar — System? Don't—you—know—there—are—myriads — of Solar Systems?"

"Our particular Sun has Venus, Mars, Saturn, Jupiter—and others," Sir Isaac called.

Tubby got a bright idea.

"I'll tell him," he said. "Save time." He dashed away over the rocks. All the little globes quivered in alarm, but the leader stood his ground. And now Tubby had the weirdest of all these weird experiences. As he ran, most distinctly he heard Sir Isaac's voice:

"Others and—Jupiter, Saturn, Mars, Venus has Sun particular our."

He was overtaking the words, hearing them in reverse as he passed them!

When he arrived beside the quivering little globe, he heard them again, right side up this time.

The globe-man bounced a little for a nod.

"What shall I tell him?" Tubby demanded.

But Sir Isaac himself now was coming forward. Tubby's heart leaped into his mouth. A new thousand or so of the little globes had bounced out of the gloom. They were swarming around the space-time-size machine! Taking possession of it!

"My Gawd, Perfessor—"

Sir Isaac turned, stricken. It was too late. He and Tubby were trapped here.

All the globes nearby were swarming away now. Their voices seemed jibing. The talking leader had disappeared.

The space-time-size machine was jammed with a horde of the bouncing little globes. And from inside a voice called:

"We're—going—to—conquer—your Earth. Come — help — us — run — this machine — or we'll—leave—you—here —forever."

Tubby gripped Sir Isaac, forcing him down into the recess between two big rocks. "Easy, Perfessor," he whispered. "They ain't foxy. They all run together. Watch me handle this."

"Come an' get us!" he shouted. "Here we are. If you try to run that thing alone, you'll kill yourselves!"

"Now we got lots of time," he murmured to Sir Isaac. "When they hear that, we won't be *here*. We'll be somewhere else! Am I right?"

Sir Isaac got the idea. He and Tubby ducked among the crags. Like flowing water, from the space-time-size machine the invaders came pouring, bouncing up the rocks toward where they had heard Tubby's voice.

Tubby and Sir Isaac regained their ship just in time. The tricked globe-creatures saw them and came bouncing back; they hurtled themselves against the door-slide as Sir Isaac slammed it.

Tubby saw the whole outside of the craft swarming with the globes. In a panic he dashed for the controls, wildly pulled a dozen levers and pushed a dozen buttons.

The whole ship rocked with a violent shock. Tubby staggered. He found Sir Isaac gripping him.

"You — you shouldn't have done that," Sir Isaac gasped.

"Done—what?"

"You've pulled the wrong levers!"

Everything was splitting with a horrible crashing and a glaring light. In the chaos there was only Sir Isaac's terrified voice:

"We're going forward and backward through time!" He was clinging to Tubby, shaking him. "We—we're getting large and small both at once! We can't do it! We'll burst!"

Or was it somebody else shaking Tubby? This didn't sound like Sir Isaac's voice:

"Hey, Tubby, come on. He's finished. We go out now."

"You're right, Jake," said another voice. "We go out now."

Chairs were rattling; people were shoving past. Tubby found himself clambering to his feet. His friends Jake and Pete were standing in the crowded aisle of the lecture hall.

"This here science, it's a wonderful thing," Jake was saying.

"That lecturer," Tubby retorted contemptuously, "he don't know nothin', compared to me. Come on, let's get out of here."

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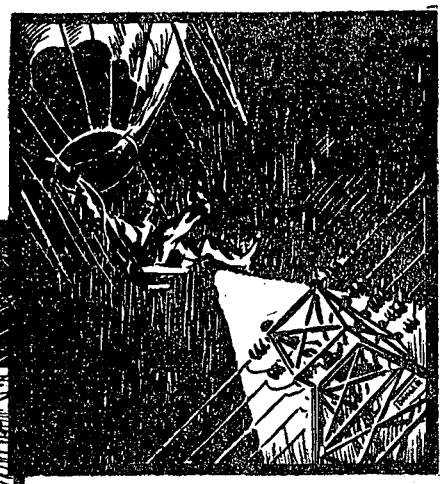
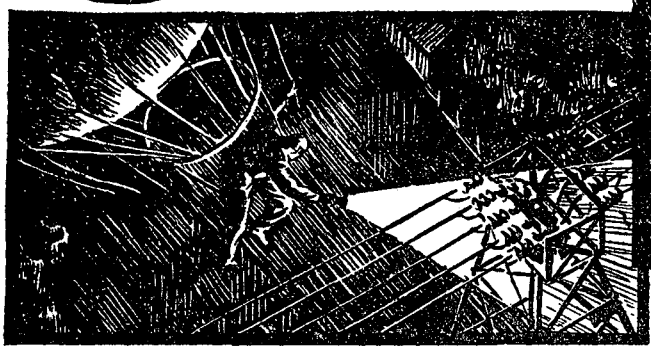
Death Waited While He Hovered in the Sky!

Crowd Waits Electrocution As Falling Balloon Wafts toward Wires





"I never did like jumping from balloons," writes G. W. de Grange, professional daredevil of Martinsburg, West Virginia, "and this time there was a mean wind to make matters worse.

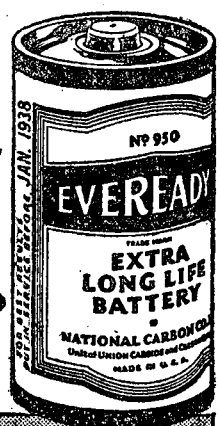
"We finally got the hot air bag filled, and I took off in the dark from the fair grounds at Emmitsburg, Md., intending to make a parachute jump into the town square.

"But the balloon was soggy. She wouldn't give me altitude. I passed about 300 feet over the treetops of the town square, and didn't dare to jump... and then the big bag began to slowly settle.

"I ripped my 'Eveready' flashlight from its straps on my 'chute harness and snapped it on to see what was below me. To my horror, the balloon was going to set me none too gently down in a nest of hot, high-tension wires!

"I've sideslipped by these death-dealing wires with a 'chute many a time... but just imagine steering a lollopy big dying balloon by pulling on the shrouds. But I pulled with everything I had while the crowd waited for an aerial execution... and because those faithful, fresh DATED 'Eveready' batteries were on the job, and showed me the wires in time, I slid by certain death by *inches!* Without light *the instant I needed it*, that crowd would have got more than its money's worth. (*Signed*)

George W. de Grange



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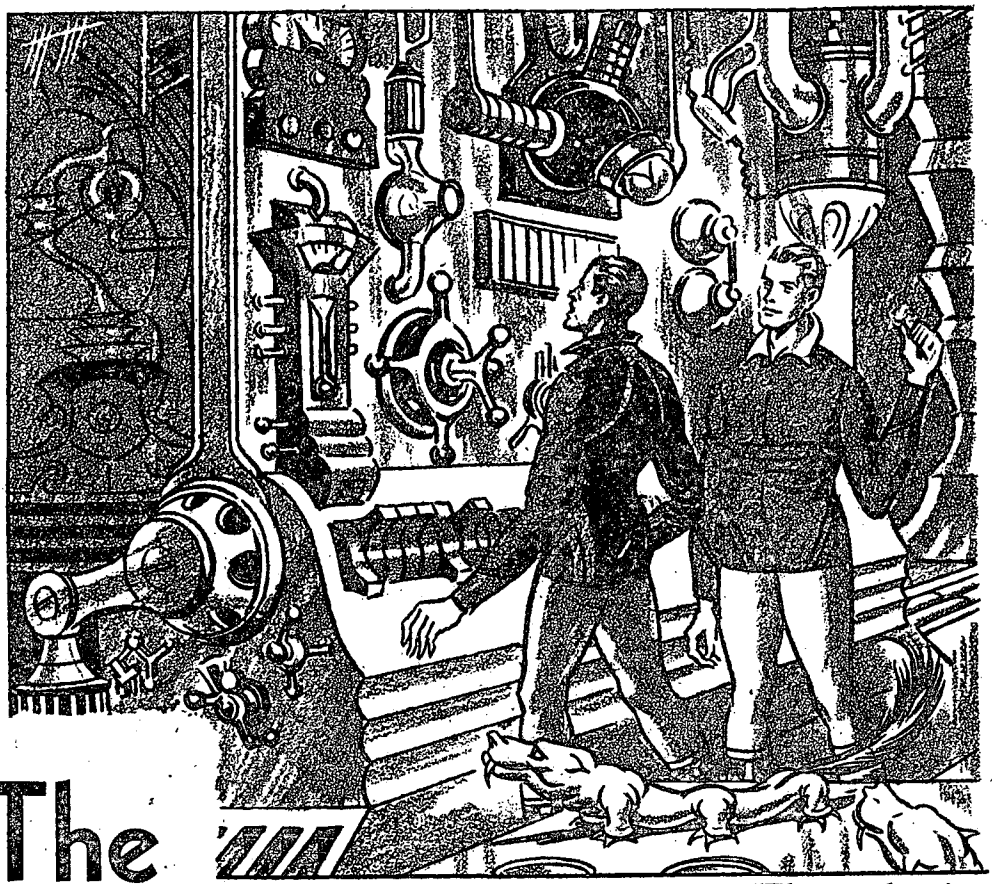
Penton and Blake, Space-Rovers, Discover



"That, my boy, is a

The IMMORTALITY

Callisto's Scientists Search for a Missing

CHAPTER I

The Second Metal

TED PENTON, of the team of Penton and Blake, regarded his companion, Rod Blake, and grinned. In the great audience hall below, twelve hundred of Callisto's scientists were assembling to hear the message of the visitors from space.

"Plenty has happened to us since Earth kicked us out for taking off some of the three hundred square miles of territory spang in the center of Europe in an atomic explosion. It's their own fault if they can't find us — outlawing research on atomic power. It was obvious when we developed atomic power that we'd be the first men to reach the other planets. And nobody can follow to bring us back unless they accepted the hated atomic power and used it."

"One," interrupted Rod Blake,

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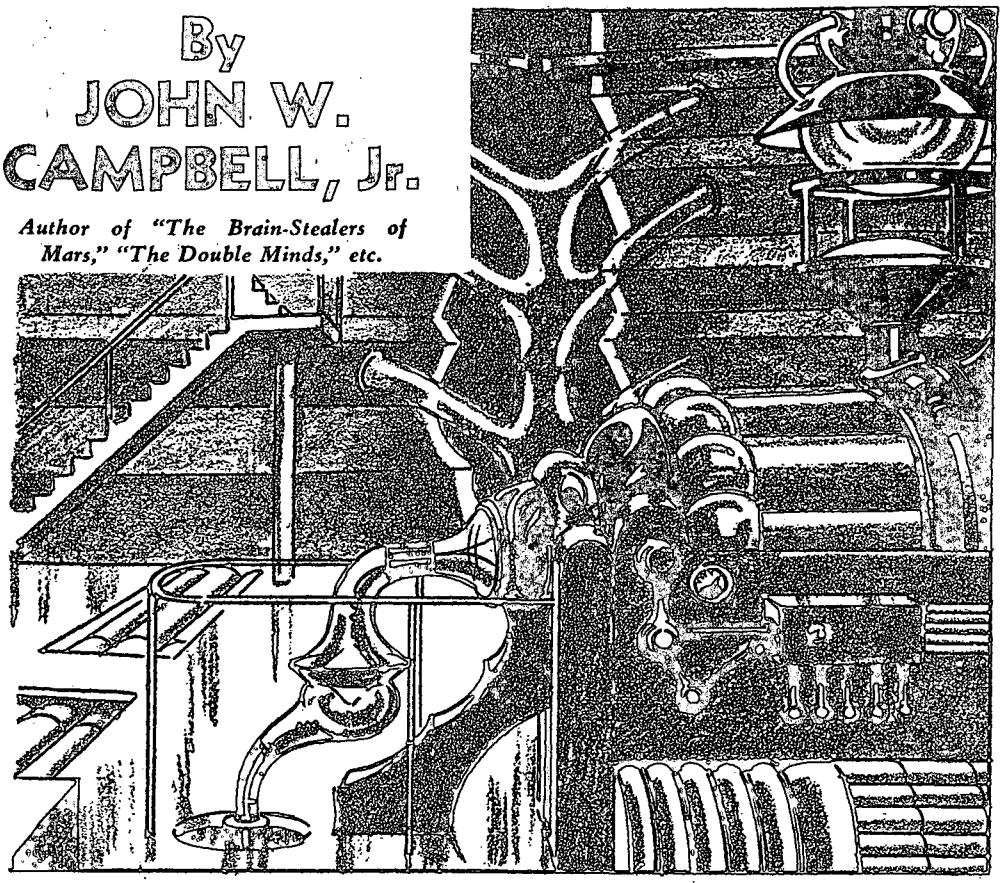
By
JOHN W.
CAMPBELL, Jr.

Author of "The Brain-Stealers of Mars," "The Double Minds," etc.



power house," Penton said

SEEKERS

An Interplanetary Novelette

ticking it off on his finger, "I learned the Martian language under the able, if painful, hypnotic teaching of a Martian master, old Loshtu. Two," a second finger, "I learned the Lanoor language on Ganymede by *your* hypnotic teaching. *You* are not a master of Martian telepathy, and it was more racking. There, we are now on Callisto and I may be blowed to the nine planets and twenty-odd moons of the Solar System before I let you teach me this language that way.

"Look at the scraps we've picked up for ourselves so far: an hour after we landed on Mars we were trying desperately to get away from Mars and their damned inhabitants, the *thushol*. Then we went to Ganymede, battled their glorious *shleath* and Lanoor, and got evicted. I won't go through that headache I always collect from learning a language via your hypnotism system if we are going to be here on

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Callisto a year or so. I can pick up the language normally in that time; so no hypotism. Got it?"

Penton smiled beatifically.

"The Callistans will want a speech from you at that conference that is so swiftly assembling. Just because we've had bad luck on those last two trips —"

"If you think those Lanoor that were chasing us meant no more than bad luck when we left Ganymede, why did you exhibit such surprising speed? Me, with two sound legs, and I had all that I could do to keep up with a wounded one. They weren't wishing us bad luck; they were wishing to elongate the vertebrae connecting my cranium with the rest of me, or I'm badly mistaken. Very peevish about it, too."

"H-m-m, mildly so. But then, you must admit those *shleath* were enough to make anyone peevish," Penton pointed out judicially.

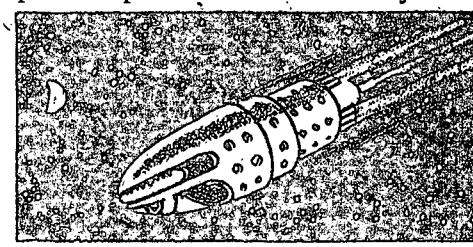
"No fault of ours. We were asked to overthrow the Shaloor overlords, which we did. They should have had sense enough to keep those fifty-foot amebas in check after that. I'd have suggested turning that courtyard where they were into a sulphuric acid swimming pool, myself."

"No fault of ours, perhaps, but they wanted someone to blame, and we were handy. If the *shleath* had had the decency to stay fifty-foot size something could be done. But now they are peeping their particularly unpleasant slime out of every rat-hole, crack and crevice in the whole city. Personally, I don't see what the Lanoor are going to do about it. The only cure I could see was to burn down the whole city—ray it out of existence. The damned things can go anywhere, through the tiniest crack; worst of all, no animal can fight them, they just digest it."

BLAKE was staring down through the ornamental grille that separated their room from the great audience hall below. It was almost filled up.

"By the way, Penton, what are you going to tell that Callistan assembly?"

"Various things," Penton sighed. "I'll have to figure it out as I go along. I had a chance to talk with Tha Lagth, the old commander who brought us here, for only about five minutes. They have automobiles—we rode in one; wing-flapping, flying machines — we watched them as we came down in our space ship. But what else they have,



I can't make out. I know they don't have fire, since no normal fuel will burn in this atmosphere, so I brought some things to amuse them." Penton pulled some loose, metal scraps from a pouch he wore, and a small bottle filled with sticks of yellowish wax and a watery liquid.

"White phosphorous for one," guessed Blake, "but the metal has me stopped. Oh—magnesium. Yes, that would burn anywhere."

"Some of them may have seen a flame in a laboratory, under special lab conditions, but I don't think they saw any in open air. They do have ships —we saw them in the harbor down there—can see them now for that matter. Say, they must all be motor ships, but I wonder what kind of motors they use? This air wouldn't let even a Diesel engine run. Electric—but how do they generate power?

"Anyway, that's the trouble. I want to find out what they know before I go spreading all my cards. Somehow, we have to stay here long enough to get a stock of edible food. I wish we hadn't been so bright, moving all the stuff from the ship into that apartment our friend P'holkuun gave us back on Ganymede."

"Yes," Blake said ironically, "Oh Ambassador Plenipotentiary of Earth. How in the name of the wavering worlds will you support *that* claim?"

"Well," grinned his friend, "Earth gave us a royal sendoff the last time we visited—all the big guns firing in our honor."

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"Probably it was an accident they left the shells in when they fired 'em," Blake grunted. "I suppose you are playing on the fact that they can't check up on you?"

"But more immediately important, how about these Callistans? You swore up and down that they were an honest, gentlemanly race. But how sure are you?"

Penton nodded toward the closet on one side of the room, where the shimmery bulk of his space suit hung.

"I discarded that suit. They don't understand mental telepathy any more than we did before the Martians gave us practical lessons — even if unpleasant ones. They can't mask their thoughts, therefore, and I know what sort of ideas old Tha Lagth had while meeting us and bringing us here. He's a nice, old fellow, and all that brusque, efficient, military air of his was due to the fact that he was half scared of doing the wrong thing.

"What is the proper formula for greeting the first ambassador of an alien planet? Who should attend to it? Using uncommon good sense, the old fellow figured visitors from a foreign world called for the whole constellation of scientists instead of politicians. More power to him. The premier will undoubtedly horn in, but I thank Tha Lagth for his kindly thoughts."

"I don't mind your discarding the space suits," Blake objected, "half so much as I regret that the only holsters we had for the UV guns and the disintegrator pistols were part of the space suits. I just like that nice, rhythmic, bump-bump-bump of a dis gun when I am on planets unknown. It makes me feel very much as though I really owned the place. Which isn't so far from the truth when you have one of those ray guns on tap."

PENTON shrugged.

"A dis gun puts that potential ownership in the realm of academic questions. If you have to prove it, there is nothing but dust left to own when you reach the Q.E.D. stage. Anyway, prepare to meet the assembled bright-lights of the Callistan intellectual world. Here comes Tha Lagth."

Blake turned with a sigh.

"I'm glad you'll have to do all the talking as Earth's ambassador. But look, can't you do that thought-projecting stunt so I can follow, even if —"

"Even if you won't take the trouble to learn the language?" Penton grinned. "I suppose I'll have to.

"Welcome, Tha Lagth," said Penton, smoothly shifting into Callistan. "The scientists are assembled?"

"Yes, Earthmen. If you are ready —" The old warrior looked at them with friendly dignity.

Seated before that audience of twelve hundred Callistans, they found Penton's guess confirmed. The premier was an unusually tall man, even among the eight-foot Callistans, with grey-white hair and a jet-black beard clipped in a style strongly reminiscent of the ancient Assyrian custom.

He was pointing out the immense importance of this occasion—historic moment—two world's civilizations—the benefits of both. The director of the Sharl Technical University rose and explained the historic moment—two world's sciences—the benefits of both. Starn Druth, the most eminent scientist of Callisto, walked slowly up to the platform, an old, shaky man, his skin wrinkled with advanced age. But his speech was sharp, clever, and avoided the obvious. Penton listened with interest, and realized that the old body carried a keen, youthful mind.

Starn Druth remarked that inevitably the available supplies of chemical elements on two worlds would differ in important, perhaps vital, ways.

"There is," he pointed out, "an element which theory has shown to be of immense importance. It exists in small quantities in the sun, but has never been found here, to our regret. Our planet is light, and has lost nearly all the hydrogen, the helium and the other light atoms it originally had when the worlds cooled from creation. The heavier worlds may well have retained these elements in small but available quantities. This—"

At the back of the huge hall, a man

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stumbled in, a man in the green-blue uniform of the Air Force. He was panting for breath, wildly excited. Despite the efforts of the attendants who rose to stop him, he ran down the aisle shouting.

Tha Lagth rose to his feet and stepped forward sharply.

"Halt!" he roared. "What is the reason for this intrusion?"

"Commander — Commander — the ship. Their ship is made of the Second Metal!"

With a single, mighty roar, the assembly came to its feet. Tha Lagth stopped abruptly, and looked to old Starn Druth. The scientist stared in sudden triumph at his colleagues.

"I said it! The heavy world retained the Second Metal!" But no one heard his voice in the clamorous shouting. Tha Lagth had taken up the gavel, and was pounding vigorously at the resonator on his desk. Slowly its sharp, piercing note struck out through the babble to quiet the hundreds of Callistans. Gradually they relaxed in their seats.

"NOW, messenger," said Tha Lagth at length, "what was found?"

"A micro-sample was scraped from the hull of the strangers' ship, and analysis performed. The chief components detected were copper, cobalt, aluminum and magnesium. The bulk of the material definitely did not answer to any known test. The analysts took a second specimen and made spectroscopic tests. The scientists reported that it was definitely identified as the Second Metal. Eighty percent of the metal of the ship's hull—hundreds of tons—is the non-existent metal!"

Starn Druth muttered something under his breath, his bright old eyes fixed on Tha Lagth. Then he spoke.

"I suggest that I explain to these strangers the importance of this Second Metal to us." He looked toward Penton eagerly.

"Most of our industry and science has been based on the study of life, bio-chemistry. Within recent years, we have learned to synthesize life-forms from inorganic elements; we make living cells, and design them for certain functions. Gradually we have developed many different types of synthetic life-forms that supply us with food, and do our work.

"But by theoretical calculations it has been shown that the greatest triumph of all, intelligent micro-life, can be produced in only one way; we know the needed combination of elements, of amino acids and carbohydrates. Many times we have gathered these things and put them together in the proper way, but the stimulating spark has not appeared. We lack the one thing which will start that life working.

"The lower forms of life we have used have been stirred from inorganic immobility to life by the flashing of the rays of radium. To procure more intelligent forms, even more powerful rays are needed, and some of our best results have been attained by the aid of immense X-ray tubes operating at nearly ten million volts. But to create the ultimate ideal, intelligent, obedient, microscopic life, we must have rays emanating from a fifteen billion volt source! Rays of a particular type.

"Our atomic theorists have proven that in all Universe, only one thing can supply just that ray; the disintegration of the atoms of the Second Metal."

Penton nodded slowly. "Huh. Beryllium. And we made the ship out of that. It's such a light element it probably all boiled away while your planet was cooling. It's enormously rare, even on Earth."

"We need it," Starn Druth explained softly, "because with intelligent, obedient life-forms of microscopic size, we can become immortal."

Penton started. "Immortality — how?"

"By directing those life-forms to make the repairs our bodies need, by ordering them to destroy malignant growths, by injecting billions of obedient defenders when infection threatens. Our bodies naturally have certain forms of defending cells, but they act instinctively. Malignant tumors—

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cancer—they do not attack, because that is a growth of the body they defend. No instinct warns them. We cannot summon them to the attack when infection begins but must wait until their sluggish instinct at last warns them. With the synthetic life we know how to make, we can guarantee ourselves immunity to all disease, injury, or senile decline."

Penton looked at Starn Druth thoughtfully a moment. His racing thoughts sized up a situation that was rapidly becoming more than warm; the only beryllium on the planet was their ship. Penton and Blake were not wanted back on Earth, where further beryllium could be obtained.

IT might be two years before their friends on Earth finally succeeded in convincing the government of Earth that the outlawed and vastly feared atomic motor would not blow up to destroy the planet—

"There are scattered, minute amounts of beryllium on Earth. In return for the knowledge of your technique of creating these intelligent forms of micro-life, I am sure that Earth can supply you with sufficient beryllium within one year."

Starn Druth looked toward him quizzically.

"We need beryllium within one month. Your ship could make the round trip very readily in that time."

"But beryllium is excessively rare—you know that. So finely scattered among so much rock—"

A scientist rose haltingly from the floor of the assembly.

"The beryllium atom, according to our calculations," he said "would not blend in with ordinary rocks. Even when very rare, it should occur in small, but concentrated deposits. It is insoluble, and hence would not disperse."

Penton looked at him unhappily. Callistan science was most unfortunately advanced; the man was 100 per cent right. "The ore is so rare," lied Penton, "that some of our most precious jewels are made of it. Emeralds—sapphires. It was only because the metal has the property of stopping certain rays in space that we were forced to use the extremely expensive material—" Penton suggested hopefully.

It didn't go over. They might never have seen the metal, but they evidently knew plenty about its properties.

"Diamond is a rare form of a common element; certain of our jewels are a rare crystalline of aluminum oxide, a common material," said Starn Druth uneasily. "Beryllium is opaque to no known radiation, save ordinary light. What are these space-rays?" He looked toward Penton with an evident feeling that something was being concealed.

"If we return at once," said Penton finally, "I can assure you a sufficient supply, a ton or more, of beryllium within one year of my planet."

"If we used the metal of your space ship," suggested Starn Druth softly, "we could arrange to have certain of the intelligent micro-life cells made to suit your body-chemistry. Both of you would be assured immortality. There would be much for you to learn here, and eventually we could duplicate your ship."

CHAPTER II

Impermanent Residence

"THAT," explained Penton ironically, nodding toward the four, eight-foot Callistans pacing the corridors from their room, "is a guard of honor. By no means let it be thought that they are warders of our confinement."

Blake looked at them morosely. "Shut up! This is one world we haven't been kicked out of yet. And is our ship guarded! Tha Lagth ordered only four rows of guards to surround it, while the scientists worked out refining methods. I wish they had put us back in that room where we first were. Our space suits are there."

"Man, those Callistans have heads on them. They knew more about a metal they had never seen than I, who had built a ship of it. There was not a

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chance that they would forget and put us in with those suits again."

"When does it get dark here?" asked Blake suddenly. "From the looks of those shadows on the orange lawn out there, the sun hasn't moved an inch since we arrived here six hours ago."

"An inch, maybe. But not much more," Penton sighed. "This satellite always faces Jupiter with the same side, like Luna facing Earth. It takes sixteen days to go around, so it will be sixteen days before that blasted sun sets. No chance of waiting for night."

"Sixteen days? It wasn't dawn when we landed," Blake protested.

"Oh bother, you figure it out. I count on my fingers and when I have rheumatism I make mistakes," Penton growled. "Man, next time when somebody wants something I say, 'Yes, sir. Right away, sir. You want the sun on your front steps? Oh, certainly. Just a moment.' I might have known that they wouldn't be in the mood for waiting. Reasonable enough. Old Starn Druth doesn't consider it advisable to wait a year or so while we get beryllium, and six months while they make and test that life-cell.

"Their president is just as old, and naturally most of the people that run the place are getting old, so it's not really remarkable that they want that beryllium in a hurry. If they can hold off for six months they live centuries more. If they die within that time—they lose immortality!"

"Somehow you don't seem interested in their offer of immortality yourself."

Penton looked at his friend.

"Do you think that anybody can figure out the entire life chemistry of a foreign life-form in a year, or ten years? They've studied their own for centuries, and now they don't know enough to control it, without invoking trick life forms. They don't know their own chemistry, and with no experimental animals to work on, they wouldn't know ours in less time than it took them to learn their own. They know damn well we are here to stay, because they can't do large-scale metal work. I learned that from Starn Druth while he was thinking the problem over. All their major works are stone or wood, or plastics like bakelite.

"No fire except in laboratory lots; their electricity is derived from some sort of primary battery, since they don't have fires or steam engines, and their gravity is too light for hydro power in quantity. It'd take them fifty years, under our direction, to build up a smelting and refining industry even based on atomic power. They'd have to start from scratch."

"I have an overwhelming desire to go home," Blake commented. "How are we going to do it, though?"

"There is no use waiting for night. They have their guards planted, but not thoroughly worked out yet, so I've sort of an idea that if we just bounce out faster than they put us in, we'll catch them unprepared. Also, if we wait a few days here, there won't be enough of our ship left to worry about. Did you get the layout of the city?"

"YES. It's a harbor city on an inland sea, more of a huge salt lake. The harbor is something like San Francisco on a miniature scale. Shaped like a Greek capital omego. We're on the left headland, in the governmental buildings, surrounded by nice, broad, orange parks. We'd be as conspicuous as a pair of zebras walking down Fifth Avenue arm in arm. The ship's at the airport on the opposite headland. The only way I can see to get there is to cross those parks, with their bright orange grass, in full daylight, and somehow get among those warehouses and docks along the waterfront.

"From there, we'd have to steal a car, and somehow get over to the port. Then we have to convince four lines of guardsmen that it's either bedtime, and they are sound asleep, or that we are just part of the scenery."

"It would help if their grass weren't quite such a vivid shade, or if we had orange clothes."

"God forbid; me in orange pants!"

"It's a good plan, Blake, only you need some details. Also, those swords the guards are wearing have such unpleasant waves in the edge. They look as though the genius who designed 'em had an evil disposition."

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"Huh. They have compressed air guns, too."

Penton looked thoughtfully down the hallway. Two guards cluttered up the doorway, conversing interestedly. Beryllium was big news, of course. Further down the corridor, two more were equally interested in the possibility of immortality. But they were very much awake.

"You know, my friend, I wonder what these birds would do if—" Penton went through his pockets and the pouch he was still wearing. He felt his flashlight, powered by a miniature, atomic disintegrator. Too miniature to do any real damage. Two packs of cigarettes that wouldn't burn in this atmosphere, which was rich in carbon dioxide and nitrogen, but too poor in oxygen to support combustion came into view. Soap, water softener, odds and ends, some pieces of magnesium scrap, and finally a small bottle of waxy, white phosphorus. "We can but try," he sighed at last.

In full view of the guards, he sat down in the middle of the room. From the flashlight, he removed the lens, the bulb, and the reflector, baring the copper contacts. From the bottle of phosphorus he removed three white sticks. Then he built up a little pile of magnesium metal on the stone flooring.

The guards had stopped talking, and were watching him uneasily. Penton had found a length of copper wire in his pocket and Blake produced another. Rapidly Penton attached them to the contacts of the flashlight, so that they extended out about three feet, a supple wand of insulated copper wire, ending in two bare bits of metal. These he wrapped around two magnesium metal nuts he found. Briefly he pressed the button of the flashlight. The magnesium nuts flared magnificently for an instant, then died as the current was broken.

The guards were drawing closer, their swords unsheathed, but looking uncertain of themselves. "Huh," Penton nodded slowly. "They are trying to make it out. Never saw an electric arc, or fire. This, I think, will be fun." He wrapped a bit of the phosphorus in a scrap of copper wire. Again the atomic flash sent a burst of flame between the contacts. This time the phosphorus came away flaring red, while an enormous cloud of dense, dirty-white smoke rolled out.

PENTON and Blake slapped handkerchiefs across their noses, and ran to the water-jar on one side of the room. In a moment the room was filled with one of the most impenetrably dense, white clouds known to man.

Penton stumbled his way through the whiteness, with the protecting mask across his mouth. Outside the room, the guards were calling; inside, one was choking, coughing, and upsetting the furniture. Penton bent over his pile of magnesium metal, and a moment later a terrific flare of blue-white light glared through the enveloping pall of phosphorus pentoxide smoke. The magnesium was burning beautifully. It made a perfect camouflage.

Sixty seconds later they moved rapidly down the silent corridor; far away, around many bends, they heard the shouts of alarmed guards.

"How the blazes do you fire these pop-guns?" demanded Blake, inspecting hastily his captured weapon.

"That stud there—it isn't a nut; it's a trigger." Penton coughed and swore. "That nose mask wasn't any too effective. And my mouth is beginning to itch from the acid."

They dodged down side corridors, past doors from which bewildered Callistans appeared, to be hurled out of the path of the two Terrestrials, muscled for a far heavier world. A door appeared at the side of a corridor, and Penton halted abruptly. He caught Blake, and looked at the lettering on the door a moment.

"Damn. Wish I'd learned their writing more consciously—I think that means exit." They tried it. At their feet, a corridor slanted downward, spiraling off to the right, and down. The steep slant made running dangerous; the thin air made running difficult.

Spaced lights gave the only illumination, doors appearing occasionally

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gave the only indication of altitude. Down — down till one of the doors burst open, and a troop of guardsmen faced them in blank surprise. The flashlight suddenly flared with the incredible brilliance of burning magnesium, and Penton charged at the group. Blake's air gun soughed softly three times, then failed as the supply of compressed air gave out.

Stumbling over each other, the guards retreated from the weirdly flaming death Penton so evidently carried; some deadly radiation known only to these beings of another world, no doubt— The Terrestrials followed their fleeing footsteps, but turned aside at the first window. Eighty feet beneath the aperture the orange lawn swaled off toward the shabby docks and warehouses.

"Let's go," said Penton. "We can stand an eighty foot drop—I hope."

CHAPTER III

Pipeline

THEY stood still, panting, two minutes later, lost in a maze of crated, baled goods, as the platoon of guards thundered across the broad lawn after them, running in great strides behind the Earthmen's crazy leaps. The masses of goods imported from unknown ports of this strange sea piled about them in an ordered confusion. Somewhere workmen were shouting, calling to the guards as Blake scurried around a great heap of crated fruit of some kind. Each crate was fully six feet square, and he halted abruptly.

"Penton, we need a residence. Catch hold." Blake swung at one of the bulky crates; it lifted easily to his Earth-strength. Five minutes later the guards deployed through the building, seeking, shouting, ordering. In a four-foot by six closet, completely surrounded by the friendly and uncommunicative fruit, Penton grinned thoughtfully.

"Here we are, hidden in this crate, walled in on every side by provisions, and with somewhat collapsed gastric regions, yet not taking advantage of the situation. Shall we eat?"

Blake looked at the fruit in the surrounding crates. They were about the size of lemons, with a horny-looking shell of bright purple with yellow-green spots.

"I don't know. I'm sensitive to color, and if they taste anything like they look, we'll be most remarkably ill."

"I'm not affected by color, but I am affected by food. They smell good, so I'll experiment. The soldiers seem to have missed us." Penton opened his pouch, and pawed through its contents. "Soap—I'm a cleanly individual but—say, it will grease the knife, though, when we cut this wood. Borax water softener — no help. Another scrap of magnesium—ah, here we are. The knife."

Carefully soaping the blade, he cut at the soft wood of the crate. Presently he had an opening large enough to admit his fingers, and a moment later gently extracted one of the weird looking things. Cautiously he wiped the remaining soap from the knife blade, and attacked the horny coating. It was thin, and almost at once gave way, to allow a dark, purplish jelly to ooze forth. Skeptically Penton tested a bit of it on the point of his knife, tasted a larger amount, and smiled approval.

"Hm-m," said Blake, sampling Penton's offering. "Quite fairish. Have you any knowledge, plucked from Tha Lagth's mind, as to—"

Abruptly there was a frantic scratching at the case near them, and a thunderbolt of peculiarly active flesh forced its way inward. Frantically Penton and Blake backed away in their tiny closet, beating at the furry thing half seen in the dimness. The creature, whatever it was, made a terrific leap at Penton, gripped, and sank its teeth with an unpleasant grating sound of power into the folds of the pouch he was carrying, tearing the tough fabric open instantly, to release a tinkling deluge of miscellaneous items onto the floor.

Instantly it forgot all about the men to paw frantically, with little whimpering sounds, among the wreckage. With an air of supreme triumph it

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came up with a small, square package, which it immediately crushed between its teeth, to consume with every evidence of the most complete satisfaction.

"My god—that was borax!" gasped Penton. "That's going to be one sick animal in a sweet short time."

PAPER and package vanished as the animal gulped heavily once. Its dimly seen head turned, and gleaming, violet eyes looked up at Penton.

"Borax," it remarked pleasantly, very happily in fact. The word echoed clearly, precisely in Penton's mind, in Blake's mind, too.

Penton sat down heavily. Blake looked blankly at the animal, now sufficiently motionless for observation. It was long, two feet long. It was low, not more than six inches at the shoulder, and it had a doglike head, with rather friendly, violet eyes. But it had six short, stubby legs, each armed with four sharp claws. It was smiling, more or less, in a friendly sort of way, and displaying a set of teeth that started with glistening, greyish fangs, almost metallic in their luster, and ranged backward to a group of opposed molars as broad as a man's thumb-nail. It had a soft, grey-brown coat of fur, and a long, gently wagging tail.

"More borax?" it amended.

"I think," said Blake faintly, "that it *likes* borax, hard as that may be to believe. In fact, I think it's a mind-reading, broadcasting pooch that came because it smelled our borax."

"Like borax," mentally agreed the animal, wagging a friendly tail.

"It looks like the result of mixing a d.t.'s nightmare with a dachshund," Penton decided. "I'm glad, at least, that it doesn't like me."

"Like you," insisted the animal. "Gkrthps likes you . . . More borax?" The mental impressions were somewhat slurred, accented, so to speak, as the utterances of a parrot are accented by the peculiar limitations of the parrot's anatomy.

"Gk — anyway, that must be its name," Blake said. "I think we had better call it Pipeline. With all those legs, tails and heads sticking out of that unnecessarily elongated body, I think it resembles a complete network of pipes," Penton sighed. "I think—and hope—that it means it approves of me in a personal way; that is, that its liking for me and its appreciation of borax differ fundamentally. Anyway, it looks friendly."

"More borax?" telepathized the animal plaintively.

"No, Pipeline, not here. You'll have to visit us some day when we get back to the ship. There is about fifty pounds of it there."

Pipeline almost danced.

"Visit the ship . . . Go back to the ship."

"Hm-m, we'd like to, too, but can't just now. Say, Penton, how far do you think this creature's mental impressions reach out? Is he broadcasting our conferences here like an animated telepathic microphone? Did the Callistans send him here for that purpose?"

"Not far. I was just becoming aware of a sensation of a pleasant odor, which must have been, actually, my picking up his thoughts as he caught the scent of borax—sweet satellites, what a delicacy for any animal—when he burst in here. It doesn't radiate far. But—I have a suspicion it has a memory."

"Memory," agreed Pipeline proudly. "Remember, they must be in here . . . Watch the exits . . . No, guard the ship . . . You're a fool, watch the exits . . . You're an infernal, insubordinate, unripe idiot . . . You're a blistering under-captain, trying to tell a general his duty . . . Get out of here before I stamp my initials permanently in your liver . . . Watch the ship, you blithering, blasting, blowing, brainless aberration! What did they escape for? . . . They want the ship . . . Go to the ship, visit the ship. Borax—more borax—visit the ship . . . They went to the ship, so why hunt the city—they'll go to the ship . . . Watch the ship."

BLAKE sighed.

"Disconnected, perhaps," he said leaning back against a crate, "but intelligent. Highly intelligent. You are a remarkable animal, Pipeline, and

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you get a full pound of borax for that, the minute we reach the ship, though what you want it for, and how you live on it beats me. You seem to have a remarkable faculty for phonographic—or telepathic—recording."

He turned aside to Penton.

"I think I know how Pipeline works. His mind, I mean. Whenever we think of something, he broadcasts all he has ever heard pertaining to that subject. He's like an intelligent phonograph record—doesn't know where to stop or begin."

"Live on borax," chortled Pipeline pleasantly. "Borax necessary for this peculiar form of life . . . This specimen I have obtained from the watchman of a local warehouse, who reports that it was given to him, together with its mate, by a sailor returning from Stakquerl . . . The dissections have demonstrated the remarkable anatomy of this beast, which, unlike other life-forms, bases its fundamental life chemistry on fifty pounds of borax in the ship.

"This type of life occurs in only that one region of our planet, and is quite common there, being represented by a complete type of evolution. This is its highest representative, capable of receiving telepathic impressions direct from the mind of one man, and regenerating those thoughts in the mind of another, while only to a very limited extent understanding the material so repeated . . . It's a mind-reading, broadcasting pooch that came because it smelled borax . . . More borax?"

Penton chuckled.

"Man, what a college education you got somewhere, even if you did get it a little mixed up. So you have a girl-friend, eh?"

"Girl-friend of my own." Pipeline sat down suddenly with the last two sets of legs, and stood up in front. Then lugubriously the animal lay down with the front legs, and stood up in back, while remaining seated in the middle. "No girl-friend of my own . . . But I have Thkrub . . .

"Oh, I begin to understand. I suspect you have it the wrong way around, Ted. This is the female of the species," Blake decided.

"Female of the species bears from fifteen to fifty young at a time; the mating season is practically continuous . . . The male and female mate for life, and at practically any time that fifty pounds of borax in the ship is available young are produced . . . The lack of more borax alone prevents this extremely fecund species from overrunning the planet . . . They have, you observe, a series of exceedingly powerful molars, capable, in fact, of crushing minerals for digestion . . . The animal is capable of ingesting and utilizing inorganic boron . . . Let's visit the ship . . . They supply their energy needs, however, from the combustion of carbon compounds, as we do, being omnivorous in this respect . . . They make highly entertaining pets where the owner can find or procure the expensive boron compounds necessary for their life."

"Brief life history. I bet Pipeline—or is it Pipeliness—has heard that lecture a dozen times. Can you suggest a way of turning her off?"

"Turn me off, that's it . . . After all these years I've slaved to help you, slaved for your children, scrimped and saved so that you could have a good time, you brute . . . Now you turn me off for some flighty, giddy-headed—more borax?"

"Who, Pipeliness, no family quarrels. You'll get borax when we get to the ship. And then only if you stay quiet until we arrive, or we ask questions. Where's your mate, Pipeliness?"

For an animal born of a small world, Pipeliness could develop speed. Penton thought this time of a male mate, and Pipeliness went to fetch him. Before either Blake or Penton could move, the animal had vanished with a soft scurry of claws.

CHAPTER IV

Stragath

"I'D never have suspected speed like that in such short legs," said Blake softly. "Do you think she'll be back?"

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"More borax," sighed Penton. "Fifty pounds of borax in the ship. Man, you couldn't lose that critter now to save you. All the repressed mother love of the last five years or so is probably welling up in her under-slung bosom. I image, from the lecture she just delivered, that friend watchman of the domestic difficulties can't feed her the boron she wants, and evidently she needs a sufficient supply of boron to have young. At any rate I need a supply of carbon compounds. She interrupted my eating rather abruptly."

"There seems to be enough jelly-fruit here to keep any two people going. Tastes funny, doesn't it? Rather like a cross between orange juice and beef gravy, unpleasant as that sounds."

"It sounds omnivorous, but isn't," Penton objected. "I have a curious desire to consume some sort of meat food. They must have some kind of—what ho! They have. Or at least that certainly looks like a local substitute for the old, familiar of seashore, quick lunches."

Blake looked at the contents of the case Penton indicated. Like the one they had first raided, it was addressed to a wholesale grocer, but this contained some item that closely resembled a seven-inch hot dog.

"Even their hot dogs are skinny. Sort of in proportion," Blake pointed out. "The thing's only half as thick as it should be, and half again as long."

Penton was quietly carving at the boards of the case. Delicately he reached in, and pulled out one of the things. His brow furrowed in deep thought.

"I know what these darned things are, but for the life of me, I can't recall the name, nor the properties. I wasn't trying to learn foods when I read Tha Lagth's mind. Yes—they're food, all right. I remember that much—seems I remember eating them as is. Well, here goes!"

Penton put a very small portion of the Callistan delicacy in his mouth, and bit on it gently. Blake stared. Abruptly, Penton's face froze in an expression of horrified surprise, his eyebrows climbed frantically to join his hair, then his eyes popped very wide open. He sat in frozen astonishment, while the right eyebrow slid slowly downward, and a slow, dawning comprehension spread over him. His hand, gripping the strange food, gripped tighter, and he swallowed, while his eyes closed desperately. Very slowly his Adam's apple crawled up, took hold, and slid down his windpipe with a special delivery package for his stomach.

His eyes opened, and he looked at Blake. A beatific smile spread over his face. The remainder of the thing vanished in three large gulps. Penton sat very still for a moment, as though concentrating on inner voices of surpassing beauty. Finally he looked again at Blake.

"Remarkable," he said in a falsetto voice. "Er—eh, I mean remarkable. You must try one." He pulled forth another and handed it to Blake.

Rod Blake looked at him with deep suspicion.

"Judging from the struggle you went through," he said at length, "I don't know that I'm so keen on it. Just what, my friend, was the matter with you?"

"I—I was trying to remember it. For a moment I thought I had. You see, there's a thing called *stragth* that is a kind of red sea worm, very poisonous; it stings. These are *stragath,* popularly so-called because they somewhat resemble that worm. Oh, they aren't, of course, but that's what had me scared. Try it—it's really delicious."

BLAKE took the thing in two fingers, very cautiously. Very cautiously, he put his teeth to a minute scrap and bit—

Instantly he dropped the thing, and jumped up. It curled violently in his grip; a thin, squealing wail of anger chattered from it through his teeth. Violently the far end of it curled up to swipe forcefully against his nose. Squealing angrily it flopped about on the floor as Blake looked at it in undisguised horror.

Smilingly, Penton reached out and pinched the far end. It lay still—and almost simultaneously disappeared as

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Pipeliness darted through the crack by which she had entered before, to gobble it down in a single motion.

"More *stragath?*" she asked brightly. "More *stragath* for Thkrub?"

Behind her a somewhat larger edition scurried in, to sniff in a friendly fashion at Penton, with a wagging, silky tail. Violet eyes in a broad, mahogany-brown head looked up at him.

"Borax," said the newcomer.

Penton fished another *stragath* out of the crate, and tossed it toward the animal. "I take it you are—well, Pipeline. We won't attempt that name of yours." The bit of food was caught expertly, and vanished instantly.

"Fifty pounds of borax in the ship . . . Let's visit the ship," suggested Pipeline, not to be swayed from an important purpose.

"Let's change the tune, Pipeline. We have about ten kilograms of boric acid, too."

"Ten kilograms of boric acid. Let's visit us at the ship." Pipeliness danced happily. Abruptly her nose went up, and she trotted over to the case.

"I wondered how she made those six legs work together," Blake sighed. "Every time she's moved before, she's gone so fast they just blurred. I'm beginning to get it."

"This animal," Pipeline stated, dogmatically, following his mate, "is, as are all members of this system of evolution, equipped with six pedal members . . . These six limbs are normally operated in the manner of a pacer, those on one side moving in unison . . . However, some members of the species vary this gait in almost any possible combination . . . Very good *stragath.*"

Pipeliness sat down on her rearmost legs, on her middle legs stood up, and reached up the case with her forelegs. Long, retractile claws reached out and with an expert flip she snared a *stragath.* The thing shot through the air to be snapped up instantly by her mate. Five more followed in machine-gunlike succession before she sent a stream toward her own swift-acting jaws.

"Efficient, Pipeliness, efficient. Could you send some our way?" suggested Penton. The animal glanced at him, her tail wagged briefly, and almost immediately Penton was bombarded by a rapid-fire stream of arriving *stragath.* Not quite as quick as the animals, he failed to catch all of them, and several fell to the floor. They squeaked instantly, doubled themselves the instant they hit the ground with an amazing vigor. They bounced into the air to strike hollowly against the crate above. Long before they hit the floor again, Pipeline solved the difficulty by consuming them.

PIPELINESS turned violet eyes on Penton.

"Penton want *stragath?*" she asked. There was a distinct note of reproach in her communication. Penton juggled frantically with suddenly animated *stragath,* while Blake grappled with two he had caught.

"What in blazes are these? Are they food or are they animals?" The angry squawling sqeak of the things was mounting rapidly as they became thoroughly aroused. Blake dropped his load to the silencing, and waiting Pipeline.

"*Stragath,*" Pipeline said, "the latest triumph of modern science. . . . These remarkable growths are developed by the magnificent cooperation of thousands of research workers. . . . I'll bet they ain't got a dozen and the damn things probably aren't fit to eat. . . . Research workers combine in the ultimately perfect proportions every item of diet needed by man. . . . Most important of all, the *stragath* soon to be marketed by Thrail Stran and Company will bring to you in delicious form these important elements in living, vital form. . . . These advertising humbugs make me sick. . . . I hear the damn things are alive enough so that when you jar them too much they start moving. . . . Swell time I'll have with them chasing all around that blasted blistering warehouse. . . . May be eaten as they naturally occur. . . . At low temperatures they may be kept indefinitely without spoilage since they are living and hence destroy all destructive molds or bacteria. . . . They won't smell anyway, maybe, well you won't

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bring any of those things into *my* house, Grag Kuolp."

Penton sighed and sat down. He had finally succeeded in pulling Pipeliness away from the hole in the crate and had seated himself in front of it. The last of the visible *stragath* had been consumed, but still there was a persistent, faint squawling.

"Damn squealing, squawling brutes getting ready to pop . . . you clumsy oaf, pick up that crate," Pipeliness commented, licking a scrap of meat from her paw.

"So that's what they are," Blake said angrily. "You might have had the decency to warn me they'd kick my nose."

Penton started. "They're moving in the crate now." The squealing grew suddenly louder, much louder. It became a rapidly rising howl that, they realized, must be echoing through the whole, vast warehouse.

"They're over here." Somewhere outside a voice shouted. The heavy rhythmic tread of running guards drew nearer. Blake rose, looking at Penton.

"I think we'll have to go somewhere else."

Penton rose with his hands above his head. The crate overhead balanced on his hands, he suddenly heaved with all his power. The crate, bulky as it was, flew into the air to land with a tremendous crash somewhere beyond. Instantly, a terrific howling, squealing riot of sound started. Blake followed the crate with another full of the quiescent *stragath*. The shock of landing broke the crate and aroused the contents.

The two Callistan dogs were incredibly active, but the *stragath* were ten thousand to one. In rapid succession, Penton crashed open four more crates.

"That may divert them," he said mildly, watching the results take form.

Penton and Blake set out hastily, entirely obscured from the sight of approaching guards by a mad, inverted snowstorm of tens of thousands of bouncing, bounding, madly cavorting *stragath*. Behind them, guards stepping on the weird things were falling in the resultant slippery mess. Blithely the Terrestrials dodged through mountainous heaps of goods, down a long lane, finally to a small locked door. In unison they charged it, their Earth-born strength proving too great for the frame of the exit.

"THEY don't look as though they could possibly carry that load," said Penton nodding toward the great lumbering trucks rolling down the broad traffic-choked artery that paralleled the harbor and docks. Immense trucks, almost lost under the vast heaps of merchandise loading them, rumbled by on wheels seemingly impossibly fragile. "That light gravity makes heavy loads light, and hence bulky. Bulky loads, my friend, suggest loads on which we can hide remarkably well. Won't you join me?"

A huge truckload of bagged goods of some type paused momentarily in the exigencies of traffic. A moment later it started on again. Penton and Blake pulled the huge bags of some granular, sticky substance over them.

"Must you pick sticky stuff?" grunted Blake. "Wonder how—hey, for the—hey, Ted—"

"Sh-h—" his friend clapped a restraining hand over his mouth. "It's Pipeline and company. I told you they wouldn't be lost easily. They just jumped on the—hey, stop it Pipeline. My face is clean—at any rate cleaner than your tongue. What happened, couldn't you hold any more *stragath?*"

"More borax," suggested Pipeline. "More borax for Pipeliness."

For half an hour the truck rumbled on slowly, stopped and started in the slow-moving, choked traffic. Finally the truck turned, stopped a moment while something rattled noisily near them, then started again with a smooth, soundless pull of acceleration. Abruptly, the traffic noises changed, and echoing reverberations surrounded them. A Callistan called cheerily outside, and another answered him from the truck.

"It's all out," said Penton hastily. "This is the delivery point, I imagine. We'll have to put these fellows to

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sleep for a while, and go on—we're inside a building of some kind—phew! Must be some sort of chemical plant." Penton stirred, the sticky bag that had covered him moved, and he stood upright. Beside him, Blake rose simultaneously, and together they leaped to the ground. Four Callistans started at them in startled amazement—and slumped soundlessly to the ground after none-too-gentle taps.

They stood on the floor of an immense single room. Reaching up a hundred feet above them, and spread out three hundred feet in each direction, it was as large as three football fields under one roof. But huge as it was, it was filled with enormous wooden tanks coated inside and out with some dark plastic material.

From the tanks, thick silvery metal pipes reached up interconnecting in a network of conduits leading across the room. Other pipes of plastic material led to each tank from a single huge reservoir at one end of the room. Somewhere, huge blowers were whistling softly.

"Whree do we go from here?" asked Blake.

"Mind your step, you blithering idiot. . . . Grag Kuolp, some day you'll learn what I mean. . . . Touch one of those conduits, and by the Gods of Space, electricity will tie you in knots of a hundred unpleasant varieties. . . . Mind your step," chanted Pipeliness. "Mind your step, visit us at the fifty pounds of borax and ten kilograms of boric acid."

Penton whistled, and looked into the animal's violet eyes.

"You can repeat only thoughts thunk near you, Pipeliness, but I take it you have an editorial ability—you repeat appropriate ones that make sense. You mean, I take it, that if we don't watch our steps, we won't visit the ship. Yes, you may be—wavering worlds, Blake—keep away from those metal things!" Penton was suddenly leaping up the wooden stairs that climbed the side of the nearest of the tanks.

BLAKE followed him swiftly, to pause as he neared the top. An overpowering odor of rank animal life assailed his nostrils; an odor, he realized suddenly, the great blowers had been dissipating near the lower levels. Faltering, he reached the edge of the tank and, not breathing the foul odor, looked down.

A Titanic mass of warm, steaming flesh lay there, an immense, quivering vat of raw meat. Into it the silvery pipes plunged, dividing into ten thousand tendrils. Into it the plastic tube fed a constant stream of frothy, bubbling liquid. From that another plastic tube drew a constant stream of putrid-smelling fluid. Nauseated, Blake stumbled away, down the wooden steps. A moment later Penton, his face greenish in hue, followed him. But the latter immediately started off across the great room to a small space on one side, where men had evidently been intended to work.

Blake found him staring at a clear, glassy panel, some ten by ten feet, connected with the silvery tubes and the maze of plastic tubes, fitted with dials, valves, gauges, and wheel-controls.

"By the Nine Gods of the Nine Worlds, and the multiple dieties of space!" Penton breathed. "These men—Blake, my lad, do you know what that is?" Penton bent forward, looked at bars, pipes, instruments and sighed. He turned around, gaping in awe. "That, my boy, is a power house. It generates power at about 1000 volts D. C."

"Which can, of course, be raised by the addition of further cells in series," interrupted the beast at their side. "The greatest difficulty is the size required to obtain practical amperages. . . . This can be done, however. . . . Take that animal out, if you will, Purthal. . . . That's the third time it's wandered in here. . . . It belongs in Farg Thorun's lecture room. . . . This can be done, as I was saying, now blast you stay where you belong before I throttle you," Pipeline concluded.

Blake stared. "Electric eels—they have 'em trained!"

"No, those aren't animals—they're synthetic life made to serve the function. This is where they get the pow-

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er for the electric mechanism of half the city, I imagine, for such services as electric controls, telephones, radio, telegraph.

"But look, Blake. The operator of this plant must be a well paid technician, and should, I imagine, have a private car. It must be in the building somewhere. I'll look down near the door the truck came in; you see if it's toward the back." Penton started toward the doorway as Blake trotted toward the dim-lit rear of the huge room. Pipeline and his mate looked at them uncertainly, then split, each following one of the two men.

Penton found the vehicle, a small, smooth-lined sedan-type car, parked between two of the giant, wooden tanks.

"Blake—" he called out. Faintly, from the far end of the room he heard his friend's answer.

"Rod, look over that switchboard, and figure out which are the mains leading the power out to the city, and open those switches. I wouldn't cut off the blowers, or the circulating pumps. That electric-flesh stuff might get peeved and climb out. I'll look over the car."

CHAPTER V

Musclemobile

FIVE minutes later Blake found him sitting on the door ledge of the car with Pipeline before him. He looked up at Blake and shook his head. "These Callistans are the super-past-masters of the grand craft of life-molding. Take a look at the engine." Blake glanced at the car, and noted that it was evidently rear-engined. A moment later he had the hood up and was looking at the mass of mechanism.

"Looks like a six-cylinder radial type, equipped with a supercharger—but it's made out of plastics. Something like the one we rode in—and wrecked—on Ganymede."

"Huh," grunted Penton. "Almost the whole car is. It's got a metal frame, but on a fireless world metal is costly. Plastics, weight for weight, are nearly as strong. This isn't painted blue; it is blue."

"The engine isn't. It looks like green glass."

"I think I pointed out that even a Diesel couldn't work in this air? That, my boy, is not an engine. That is an animal, a nice, synthetic animal."

"*Animal!* A six-cylinder animal? With a gear-box and ignition system?"

"No, six-muscle animal. The supercharger is not a supercharger; it's a blower, a mechanical lung. The fuel tank contains not gasoline, but a sugar solution. I tasted it. The ignition system, on the other hand, is made up of synthetic nervous tissue, and a few, miniature electric cells for stimulation. Muscles, my friend, don't need a high oxygen concentration; they repair themselves, renew themselves, and grow stronger with use.

"I didn't have time to look, but I suspect that that animal engine also has a series of synthetic kidneys to remove waste products, and probably some oil-secreting cells, like the oil glands in your elbow, to supply lubrication. Six muscles pulling on tendons connected to a slip-ring—probably made of non-poisoning silver—a metal crankshaft geared direct to the wheels. The speedometer reads to the equivalent of eighty miles an hour; about the speed of a greyhound in good training."

Blake looked thoughtfully at the streamlined vehicle.

"I wonder, would it answer to the name of Rover, do you suppose?"

"No, but it would answer to the controls, which consist of nerve tissue stimulated by small levers. The steering mechanism consists of four muscles working the front wheels." Penton sighed. "Rod, we Terrestrials never began to guess what life could be made to do. A muscle is three times as efficient as a gas engine, and so far as weight per horse-power goes—your thigh muscle weighs ten pounds, works at the wrong end of a 10 to 1 lever, and can still lift three hundred pounds. I've seen you do it. That's a pull of 3000 pounds from a

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ten-pound lump of watery, almost substanceless jelly."

"But oh, my friend, how tired that muscle can get. And it doesn't move me any eighty miles an hour—even when P'holkuun and his whole tribe were after me and I was entreating it to do so," Blake pointed out.

"What you need is a mechanical lung with plenty of capacity, like that blower, and a plastics heart, like that centrifugal pump I noticed. The muscles of your heart work indefinitely without stopping because their blood supply is adequate. Even a gasoline engine gets tired if you stick a potato in the exhaust pipe and clog it up with waste products.

"But the important point is this; if you feel convinced you can walk faster than this thing can go, walk—I'm riding. You can, however, do the driving, if you like. Your legs are longer, and I must admit that this was designed for an eight-footer. I'll show you the system." Penton paused a moment. Sounds were floating through the still-open door through which the truck had brought them. "Hm-m-m—I think you must have upset the traffic light system from the sound."

"There did seem to be an argument among the truck drivers as I came over here. I wondered about that. Of course, we don't mind an accident or two, but even this muscle-bound, leaping Lena won't crawl over those trucks. Just how did you plan to help us make speed across the city by plugging traffic hopelessly?"

"Get in, and we'll start. I'll show you what I had in mind." Penton grinned. Pipeline and Pipeliness tumbled over Penton as he climbed in after Blake. Cautiously Blake tested the controls, a little lever running back and forth in a slot, a transverse bar that controlled direction, a single foot pedal that applied a friction brake. The car moved forward with a steady, smooth thrust as he advanced the lever in the slot.

The wheels turned, and they were driving out through the great door. Trucks, blocks of huge trucks stood in the street, bleating feebly on high-pitched horns that echoed unhappily in the thin air. The soft whine of the blower under them was scarcely audible.

"You can get through with this small car where those bulky things can't—er, wiggle a muscle. Turn right when you get out of this drive, and make time."

Five small cars loaded with uniformed guards were weaving through the lines of stalled trucks, sirens howling angrily. A path was opening up slowly, with much backing, twisting and turning on the part of the trucks.

"I think I'll park," suggested Blake, pulling to the curb.

THE guards rushed by them, heading, very evidently, for the power house. More guards were rushing up from the opposite direction. Several more carloads, in fact.

"Nice of them," grinned Blake, putting the car in motion again with a smooth, soundless rush. "They've opened a path for us."

"I hoped they would," Penton nodded. "Keep—"

"Hey—Ted—" Blake slowed the car savagely, cursing bitterly. "You back-handed idiot, we're headed the wrong way. That's the Assembly Building we just got out of up there."

"I was worried for a minute. Get going. Naturally it is; how did you hope to get through four successive lines of guardsmen? Four, very alert, very thoroughly organized lines? This place here, I hope, and suspect, is not guarded. Did you happen to recall that this is the one place on the planet where they *know* they won't find us? And that the failure of the power plant called all the guards available at headquarters for soothing innumerable traffic snarls, and other duties.

"And do you suppose they stopped to remember that we had two ultra-violet guns and two dis-guns in those space-suits? Not so, my lad. And forty lines of alert guardsmen won't argue with four weapons like that.

"You may drop me at the window there. Sure—the fence is ornamental and made of wood—I know. I haven't

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yet had a chance to get out all the splinters that remind me that I didn't quite jump over it."

Blake, smiling broadly, swung the car. The light wooden fence surrounding the broad, parked lawn dissolved in a hail of flying splinters as the car shot up the rise to the white stone building, its wheels skidding on slippery, crushed grass. It paused a moment under huge windows, twenty feet from the ground, while Penton stepped out.

FOUR guardsmen stepped out of a door two hundred feet away, to see Penton flying upward in a leap that brought him to the window ledge. The guards retreated before the angry charge of a half ton of automobile. Their compressed air guns sent slugs that rebounded uselessly from the tough, thick plastic of its windows.

"The most recent weapon of civil defense," stated Pipeline dogmatically, "is expected to end the reign of automobile bandits. This vehicle, made entirely of hard metals instead of plastics, is mounted on six wheels, each individually powered by its own motor of nine muscles. . . . Capable of a speed of nearly one hundred and fifty kilometers an hour it won't do any good. . . . Those bandits haven't got any respect for life at all and they'll probably hold up your warehouse one of these days. . . . Get up. . . . I have to—"

Blake noted the cause of these remarks. It was made of metal, grey, hard metal. It had six, small, thick windows, and six large, heavy wheels, under humped, bulging motors. Muscles or not, they drove the thing at a crazy pace, straight for the little car. Blake dodged desperately. The charging behemoth swerved angrily, its heavy, protruding ram held toward him steadily.

Six nine-muscle motors gave it acceleration almost equal to that of the light vehicle; a Callistan driver in a Callistan vehicle gave it the needed edge. Desperately Blake streaked along the wall of the building, almost in front of the heavy, armored car. Avoiding the dangerous, direct attack that Blake had hoped would pile it against the stout, stone wall, it paralleled his track, to squeeze him against the wall. Desperately he braked, hoping it would overshoot.

The light car swerved, wagged, almost, on slippery grass, front wheels locked far to the right. The heavier car tore through the slippery surface to gravel beneath; it held parallel to him exactly. Brakes off, and with the control at full ahead, the blower whined in sudden speed. The wheels slipped, gripped, and Blake's car leaped forward. Six-wheel drive gave the heavier car the edge, and only Earth-trained quickness of perception enabled Blake to reverse, slew completely around, and start madly back from the trap before the other was after him. Desperately he tore off across the lawn, glancing at the rear-vision mirror. Speed—perhaps in speed—

There was an enormous black mushroom sprouting there on the lawn. Blake slowed gently and turned around. An enormous mushroom of impalpable dust, settling very slowly in even this thin air. And a huge cavity, twenty feet across and unguessably deep where the armored car had been. Slowly Blake drove back toward the neat, round hole that had appeared in the wall of the Assembly Building. Penton climbed into the car.

"They have the telephones working again," he said cheerfully, "I don't think you did a very good job on the power plant. Here are your guns." Penton adjusted his somewhat, and put the blunt, heavily insulated muzzle against the windshield. A neat, round hole appeared, large enough to allow the gun's passage. Presently a duplicate port graced the side window. "But it's not all to the bad. As it is the airport officials will know what the disintegrator did to that armored car. I don't think they'll argue."

"The telephones working, eh?"

"Yes, somebody in a pink jacket with pale blue pants was yelling into one that all the guards were blind. I gave 'em a light dose of UV. They'll

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be all right in an hour. He was getting an answer, too."

* * * * *

BLAKE looked down. Callistans were slowly filtering back to the airport they had so recently and hastily deserted. The vast traffic snarl of the city was slowly straightening out as the power plant went back into operation, and signal lights, telephones and radios went back to work.

"They've formed what guards can still see around that metal you left," he reported. "I hope they are grateful."

"I know. We didn't have to leave it, but on the other hand, why not? We had those spare plates, about five hundred pounds of beryllium. They can get started, and treat older people, the sick, with the life-cells they can create with that. And—somehow, Rod, I want to keep friendly with those people. When we do get back to Earth, the things they can teach us will be worth knowing, and they are, fundamentally, a pretty decent bunch."

"Pretty decent bunch," agreed Pipeline, very proudly.

Only Blake could turn around; Penton was busy at the controls. He was silent for some seconds, then he spoke softly.

"Ted, my friend, we better make time for Ganymede."

"Ganymede? P'holkuun—" Penton started.

"*And* the *shleath*. No, we weren't popular. But we will be, we will be. Did you happen to think that no *shleath* could possibly digest Pipeline? Pipeline is made of boron. But Pipeline, on the other hand, would probably enjoy a meal of—"

"More borax?" hopefully suggested Pipeline.

"God forbid!" said Blake hastily. "*Shleath*, lots more *shleath*."

Penton looked up at Blake suddenly, and grinned.

"You are right, by Jupiter, they can! A *shleath* can't digest boron, of course, and they can destroy the *shleath*—but they can't! There are thousands of *shleath*, more—"

"Borax," pleaded Pipeliness. Somehow it sounded weak, and very satisfied.

"*You*," said Blake very softly, "don't know. The prof on Callisto said they were a very fecund race. If I had known, had I guessed what he meant, they would have got no borax on *this* ship. As it is—all I can suggest is that we hurry. Two Pipelines in this ship are pleasant, but—"

Slowly Penton looked down. Pipeliness was sitting proudly, if somewhat crampedly among some fifty, three-inch-long, six-legged, furry animals.

Fifty minute, friendly tails waved in pleasure.

"Borax?" suggested fifty small, very friendly, mental voices.

"No," said Penton softly, but very definitely. "Not, my friends, by a damn sight. Not until we hit Ganymede."

Next Issue: Penton and Blake in THE TENTH WORLD

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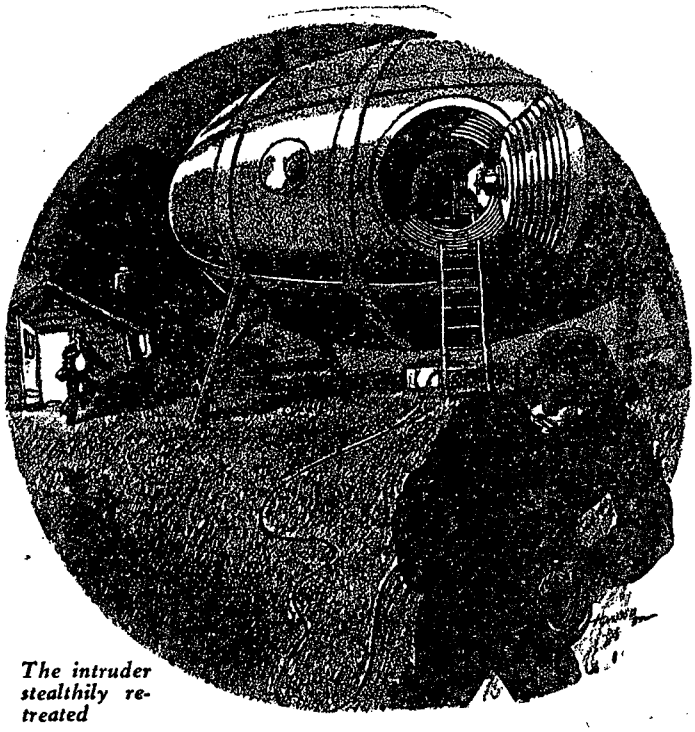
The Power and the Glory Were His for the Taking, But a Strange Visitor Changed His Plans!



The intruder stealthily retreated

HOLMES' FOLLY

By EDMOND HAMILTON

Author of "Mutiny on Europa," "Cosmic Quest," etc.

THE man's hands were clenched as he faced the grinning reporters, and his gaunt, tired face was flushed a dull red, but otherwise he showed no sign of emotion.

"My ship will take off tomorrow night and it will successfully make the first space flight, to the moon and back," he repeated doggedly.

"But, Doctor Holmes," protested the immaculate, slightly supercilious representative of the New York *Globe*, "you can hardly blame the press and public for being skeptical, in view of your previous failures."

"Yeah," rudely broke in the stocky, blatant reporter of the *Daily Tab*. "Four ships you've built, and not one of them was ever even able to leave the ground. And then you get mad because we call this one 'Holmes' Folly Number 5.'"

John Holmes' gaunt face flushed deeper, and his grey, toil-worn eyes showed what he felt. His lips were tightly compressed as he surveyed the half dozen men in front of him.

There they were, grinning at him in open incredulity and amusement, waiting for him to make a statement so they could twist and distort it for the entertainment of the public. The thick-headed, blind public, that had laughed so loudly at him each time his four former ships had failed.

John Holmes' clenched fingers dug into his palms as he stood there, remembering. Then he looked beyond the grinning reporters, to the dull-looking, torpedolike metal bulk of Number 5, poised there beside his construction shacks on this bare hilltop. And from his lips burst a flood of long-repressed emotion.

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"You will all be here tomorrow night to see me fail again, won't you?" he said in a low, taut voice to the reporters. "Waiting to mock and jeer me again, to pillory me again as a mad dreamer? Well, this time you are going to be disappointed. For this ship is going to rise, to venture out into space, for the first time in man's history.

"Yes, my other four ships failed. Their principle was wrong. But this time I have found the secret of interplanetary flight. The warping of gravitational lines of force! Every planet, every celestial body, radiates a gravitational field. I've found a way to warp the lines of force from any celestial body, focusing a great number of them upon my little ship, concentrating upon it a pull from that body so that the ship will be jerked out into space toward that other world."

John Holmes paused. A bitter smile came over his face as he saw that the reporters before him had not changed their skeptical expression.

"You still do not believe?" he said softly. "Then be here tomorrow night, and see for yourselves."

"We'll be here," chuckled the *Daily Tab* writer. "We haven't missed one of your shows yet."

"Don't know what we'd do without you, Doctor Holmes, in a dull season like this," another grinning reporter added.

The reporters moved off down the hill, laughing among themselves, heading toward the village from which their satirical, mirth-provoking stories would soon hum out over the wires.

John Holmes stood looking after them, a lank, stooping figure in the twilight, bitterness still in his eyes.

"Fools," he muttered to himself. "After tomorrow night, they and their kind will be worshiping at my feet, hailing me as the greatest man alive. The blind, stupid applause of the mob, as unreasoning and meaningless as its ridicule."

He turned, and gazed yearningly at the silent metal shape glinting vaguely in the dusk.

"So many, many years," he whispered. "So long, that lonely, hopeless work, those heart-breaking failures. And now, success at last. If they only knew—if they only knew that I've secretly tested *this* ship already, that already it has flashed outside the stratosphere and back again—"

He looked upward. Stars were pricking out in the darkening sky, the dull red shield of the full moon was rising eastward.

"That dead globe first," he muttered. "Then the planets. One by one."

He could not sleep that night. He lay on the cot in the dark interior of his little cottage, watching the silver bars of moonlight from the window slowly slant and circle the room. A hushed silence wrapped the nighted world that he was so soon to leave, a breathless, waiting suspense.

JOHN HOLMES could stand the strain of it no longer, and at midnight he arose restlessly from his cot. He looked out of the window at the metal thing gleaming in the moonlight.

Something was moving out there! A dark shape, stealing between the shacks toward the silver ship. Holmes' brain sounded a frantic alarm instantly. He snatched a revolver from a desk, jerked open the door and moved with soundless swiftness through the shadows after that furtive intruder.

Now he saw the other more clearly. It was the dark figure of a stooping man, carrying a square, heavy burden. Holmes saw the prowler put down that burden under the curving bow of the little ship. Then the intruder stealthily retreated, trailing something behind him. Trailing cords, or wires—

Wires? Suddenly Holmes understood, with a wild throb of panic. That square burden—explosives of some sort that this prowler had placed under Number 5! And now the other was retreating, paying out behind him the wires that would enable him to detonate the explosive and destroy the ship.

John Holmes ran wildly out into the open moonlight. The other had

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reached the edge of the hilltop, and was bending down over the wires that led back to the ship. He must be getting ready to detonate the charge—

Holmes fired. The shot cracked thinly in the moonlight. The prowler collapsed limply, and lay feebly stirring on the ground. As the scientist ran toward him, he saw that the other was still trying to find the wires with weakly moving arms, to detonate the charge.

Holmes was quickly upon the other and kicked the wires out of his grasp. In blind panic for his life's work, the scientist ran back toward the ship, snatched up the wooden case of explosives from under its bow, and carried it to a safe distance. Only then, trembling and gasping from the narrowness of the escape, did he return to the man he had shot.

That man lay unmoving now in the moonlight, his face turned to the sky. It was an oddly flat, dead-white face, button-nosed, the eyes covered by big dark spectacles. All of his body but his face was covered by dark clothing, hat and gloves.

His arms twitched feebly. Roughly, Holmes picked him up and carried him into the cottage. He dumped him on the cot and then turned on the light. And then he turned to the limp figure on the cot, his gaunt face grim and merciless.

"Damn you!" he muttered in hate. "What crazy idea made you want to destroy my ship? I'm glad I got you—glad you're dying, do you hear?"

The other's voice came in a faint, hissing whisper from his thin, slitlike mouth.

"*Koro*—water—"

"You try to destroy my life's work, on the very eve of my success, and then ask me for water," raged John Holmes. "No, you'll get nothing from me, not even that."

The odd, gashlike mouth in the dead-white face hissed feebly again. "*Koro*—"

Holmes frowned wrathfully down at the dying man, his breast still seething with fury. At last he strode to the sink in the corner and brought back a cup of water that he forced roughly against the dying man's thin lips.

The water slopped and dribbled over the chin and coat of the other. He sighed, as Holmes took the cup away.

"Who the devil are you?" the scientist grated. "What made you want to wreck my ship?"

He reached down and snatched away the big dark spectacles. The eyes of the dying man looked up at him.

John Holmes froze. Those eyes were not human eyes. They were enormous, round, shining, faceted eyes like those of an insect, yet glimmering with a dying intelligence.

Frozen, Holmes stared down into them. Then his hand reached and pulled aside the coat and shirt of the creature. The shirt was soaked with *green* blood. Beneath it was revealed a wholly unhuman body, covered by an exoskeleton of hard, shiny green chitin.

A HALF dozen short, horny limbs extended along each side of this alien, arthropoid body. To two of them were attached jointed metal arms that ran through the coat sleeves to simulate human arms, and to two lower ones were affixed similar artificial legs. This was a totally unhuman and unterrestrial thing, disguised cleverly as a human.

"In God's name—who—what—" John Holmes choked, staring.

The head, that unhuman head that by means of cunning surgery and white pigment and a wig had been disguised into semblance of humanity, jerked feebly. The slitlike mouth opened.

"Orlu," it murmured. "I have failed, Orlu—I am dying—"

"Orlu?" repeated John Holmes frozenly.

The fading, faceted eyes looked up into his. "I am Thal of Orlu—the world you call Mars," the creature whispered. "My people there—all like me. Our civilization there is old—older than man—"

The faceted, dying eyes held something strangely akin to human heartbreak.

"Long ago we came to this Earth of yours, secretly exploring. In ships—

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much like this one you have built. When we found you living, intelligent creatures here, we thought at first—to make ourselves known to you. So that we of Orlu and you of Earth might travel and trade between our worlds.

"But—when we saw the nature of your people, we saw it could not be. Fierce, cruel, avid for conquest, these hordes of man—they would not be our friends. They would take what we could teach them, but once they learned from us how to build ships of space they would sooner or later descend in them on Orlu—conquer my peaceful people, exterminate us as they have exterminated other species here. We saw that they must not learn of us, must not learn how to build ships that would take them to Orlu—"

The hissing whisper that was Thal's voice grew weaker, charged with infinite despair.

"A few of our race, disguised as human beings, were left here. Their mission, to prevent men from learning how to venture into space. But we few—it was hard for us to live long on this alien world, we died one by one. I, Thal, am the last of the secret spies of Orlu on this world. And I—I have failed my people—

"Yes, the doom of my race is at my door. I knew when I read of your new ship that it would succeed, would pierce space and enable your people at last to descend on Orlu. I came to destroy the ship and you. And I failed—failed—"

John Holmes listened like a man in a dream. The faceted eyes of Thal were losing their light, the intelligence behind them slipping away. The thick green blood flowed more rapidly from the bullet hole in the creature's chitin breast.

Silence, a deep silence of moments in which the creature on the cot and the man of Earth stared at each other. Then the multiple arthropoid limbs of Thal stirred weakly in a last, nerveless twitch.

"To die so far from Orlu," he whispered. "On this alien world—"

Suddenly the grotesque limbs were still, the faceted eyes blank and dead.

John Holmes, his gaunt face a rigid mask, stood looking down at the dead creature on the cot for a long time.

Then, moving slowly, he took a spade from a corner and went out into the moonlight to begin digging a grave for Thal of Orlu.

IT was the following night, and the crowd that had gathered on the hilltop was so dense that watchful authorities had strung a rope barrier around John Holmes' workshop and ship. A monotone of chatting, laughing voices rose from the crowd as they waited. Photographers were preparing their cameras, and expectant reporters waited.

A gay shout went up from the crowd.

"Here he comes! There's Holmes!"

"Bring us back a piece of green cheese from the moon, Holmes!" a voice shouted.

There was a roar of laughter, and it was followed by other barbed jests.

"Try to get her a foot off the ground this time, won't you?"

"How about us giving you a shove to get you started, Holmes?"

John Holmes did not appear to hear the chorus of mocking shouts as he walked steadily from his cottage toward the little ship. His gaunt face was set and colorless, and he paid no heed to the popping flashlights of the grinning photographers, or the rapid-fire questions of the reporters who ran alongside him.

At the door of the ship he turned, and spoke for the first time.

"You had better stand back," he told the newspapermen. "There will be a backrush of air when the ship leaves the earth."

"That's all right—we'll take a chance," grinned one of the reporters.

"Get set to snap the ship as she goes up!" another called mock-seriously to the photographers.

A wave of laughter went up as the crowd heard the joke. It was punctuated by a steady, grinding sound as John Holmes entered the little ship and screwed shut the round door.

The laughter and calling voices died away into silence, as a steady humming became audible from inside the

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craft. The humming grew louder. For a moment, there was almost an air of suspense in the crowd. A few of the reporters began to edge back, nervous.

Then suddenly there came a loud, crashing bang from inside the ship. It was followed by dead silence. The humming had abruptly stopped.

A roar of mirth crashed up from the crowd, and the chorus of laughing cries broke forth anew.

"She's busted, just like the others!"

The round door of the ship opened, and John Holmes came slowly out, his shoulders sagging, defeat written on his face.

"The mechanism failed — wrecked itself," he said tonelessly to the reporters. "Number 5"—he seemed to swallow hard—"Number 5 is a failure, like my other ships."

"That's all right, Doctor Holmes," the newspapermen told him, trying in vain to hide their smiles. "You can build another ship; you'll hit on it yet."

John Holmes shook his head dully. "No, I will never build another ship. Space travel—space travel is beyond human science, as yet."

The crowd drifted away down the hill, still laughing. A few souvenir hunters prowled around the ship for a while, staring curiously at John Holmes standing motionless by the door of the craft. Then they followed the others.

John Holmes found himself alone. He could hear the voices of the last of the crowd, drifting back up the hill to him through the moonlight.

"The old crank sure worked long enough at it before he got some sense, didn't he?"

A laugh, and, "I guess five Holmes Follies were enough even for him."

John Holmes turned slowly and looked in through the open door into his ship, at the mechanism in there that he had just deliberately wrecked with his own hands. He stared at it a long while, an infinite aching in his eyes.

But when he turned his gaze toward the spot beside his cottage where the spy of Orlu lay buried, he nodded slowly. And he spoke, as though to the dead creature in that grave.

"You of Orlu were right, Thal," he whispered. "It is not time yet for we men to venture out into space, to carry our wars and persecutions and conquests to other, peaceful worlds.

"Maybe, some day when we have put aside hate and war and conquest, another John Holmes will build another ship. Some day—"

IN THE NEXT ISSUE

THE MIND MAGNET

A Novelette of the Stratosphere

By PAUL ERNST

WILL YOU RISK 10¢ TO GET A PAINLESS SHAVE?

To get you to try Listerine Shaving Cream, we make this unusual bargain offer... Used-razor-blade container of genuine porcelain, designed by Esquire Magazine sculptor, Sam Berman ... and 20-day trial tube of Listerine Shaving Cream ... both for 10¢, which barely covers cost of packing and mailing.

Listerine Shaving Cream is great for tough beards and tender skins. A half-inch billows into a face-full of soothing, beard-wilting lather. Leaves face cool, smooth, and eased. Regular 25¢ size is a giant tube good for 104 good shaves.

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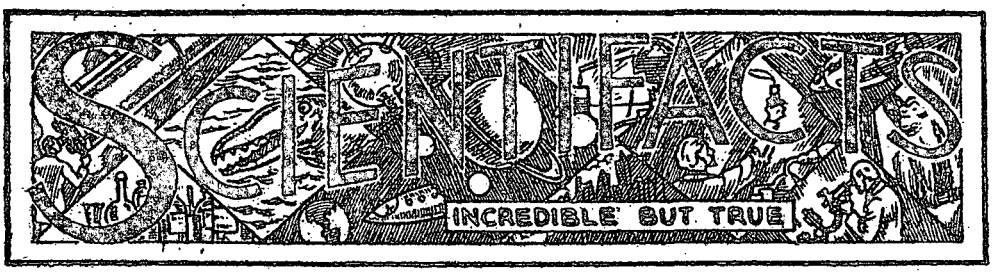

A BRAND-NEW, FASCINATING FEATURE

By J. B. WALTER

NO MAN CAN SEE MORE THAN 192 MILES!

DR. WILLIAM BOWIE, of the U. S. Geodetic Survey, declares that 192 miles is "the longest observed line" possible in the world. This was achieved with helioscopes using mirrors 12 inches in diameter.

He cites the line between Mt. St.

Helena and Mt. Shasta, a distance equal to 192 miles. It is "the largest geodetic ray ever secured." It was obtained in triangulation work.

In considering the ability of the eye to recognize objects on Earth at a distance, we must consider two important limitations imposed by the earth itself—the curvature of its surface and the density of the atmosphere.

THREE THINGS YOU CAN'T DO!

YOU cannot unroll tire tape without making light. The separation of the tightly adhering surfaces produces a glow easily visible in the dark. . . . It is absolutely impossible to shoot a bullet from a revolver or a rifle horizontally. Regardless of the speed of the forward moving projectile, the bullet always falls due to the effect of gravitation upon it. Consequently, the path of the bullet is always curved. . . . You can't walk without generating electricity. Even if there is no friction the impact causes electrification.

THE GREATEST THREE-FIGURE NUMBER

M. LUISANT, mathematician of the Paris Ecole Polytechnique, has calculated that the greatest number that can possibly be written with three figures is 9^{9^9}.

The result is a number with 369,693,100 figures—the first is 4, the last figure of it is a 9. It will take more than 28 years and 48 days to write the result of this calculation, assuming one individual wrote one figure a second, ten hours a day, every day in the year.

The paper on which the figures are written would stretch from New York to Chicago!

ICE CAN MELT RED HOT IRON!

A PIECE of ice can melt a red hot sheet of iron. A red hot piece of iron, if placed about a half inch above a piece of ice, when given a vigorous blow will descend and crush the ice, causing it to change into water, then into hydrogen and oxygen gas, which will explode and very often melt the piece of iron.

YOU CAN SEE WITH YOUR SKIN!

THERE are many different varieties of nerve endings in the skin which modern histologists have demonstrated as being in the outer layer

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of the dermis (the sensitive layer of skin beneath the epidermis).

There is another form of nerve ending described as occurring in the epidermis of a pig's snout; these nerve endings are composed of microscopical expansions interposed between the cells. Professor Lewis Farigoutte, of the University of Paris, says that these forms of nerve endings have to do with the sense of touch, and some of them are also associated with the sense of vision.

He pictures the microscopic expansion as being little eyes, and thus, that a collection of a group in certain parts of the body would constitute a compound eye. The visual impulses originating from the skin are then transmitted via the central nervous system, in the same manner that the impulses from the eye are conveyed to the optical lobe or any other center of sight.

Professor Farigoutte has been experimenting his theories on the hypnotized blind, and thus far claims to have had encouraging success.

ALL THE WATER IN THE WORLD!

IT would require a gigantic steel tank 691 miles on a side, forming a cube, to hold the 330,000,000 cubic

miles of water comprising all our rivers, lakes and oceans.

This huge reservoir would extend from Washington, D. C., to Jacksonville, Florida, and if the water was allowed to escape from the huge tank over falls equivalent in size to Niagara Falls, it would require seventy thousand centuries for it to empty!

THE MOON IS NOT FROZEN!

YOU can boil water on the moon! According to Donald H. Menzel, Ph.D., of Lick Observatory, the temperature of the hottest portions of the moon is about 120° C (250° F)—hotter than boiling water. The theory, then, that the moon is a frozen waste is more than unconfirmed.

The moon's heat was measured with a device for detecting the heat of heavenly bodies, the thermocouple. The lunar radiation comes from that part of the moon's surface upon which the sun's rays are most incident perpendicularly.

THESE GIANT INSECTS!

THE strength of various insects, in proportion to that of man, is phenomenal. If a man could lift as much

in proportion as a mere beetle can, a 200 pound man could lift 1000 lbs. A honey bee can carry 23 times its own weight. But the English entomologist, Weir, points out a still more incredible fact peculiar to the insect world.

The Hercules beetle, weighing only one-fifth of an ounce, can carry a load on its back that weighs 5½ lbs.!

LARGE BRAINS DO NOT MEAN INTELLIGENCE

GREAT intellect and large brains do not always go together. When Anatole France, the brilliant author, died in 1924, he directed that his brain be weighed. The result showed a weight of 1,190 grams—decidedly less than the average. A typical brain of a man weighs about 1,300 grams. The brain of France was exceedingly wrinkled, however. Anatomists believe that there are more and deeper convulutions in the brains of intelligent persons.

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The CAVERN of the

A Complete Novelette of An Adventure in Relativity

I fired the trinite

CHAPTER I

The Ether Eddy

I JERKED down the result-lever of my Merton Calculator, and the rattle of its gears was loud in the deserted reaches of Flight Control Headquarters. The flight-graph imprinted itself on the space-chart, the thin red line that would guide the newly launched *Phobos* on her maiden voyage to Venus. I glanced through the transparent quartz wall at her tremendous bulk, vague on the vast tarmac of New York's Spaceship Terminus in the brooding dark of 3 a.m.

The graph line I had just traced jogged erratically, a million and a half miles out, detouring the *Phobos'* course a hundred thousand miles. That hump was why I was here, alone in the crystal hive. At midnight the message had pulsed in on the infra-red ray from the domed air-cell on

Gurd Silton Speeds Into the Cosmos to

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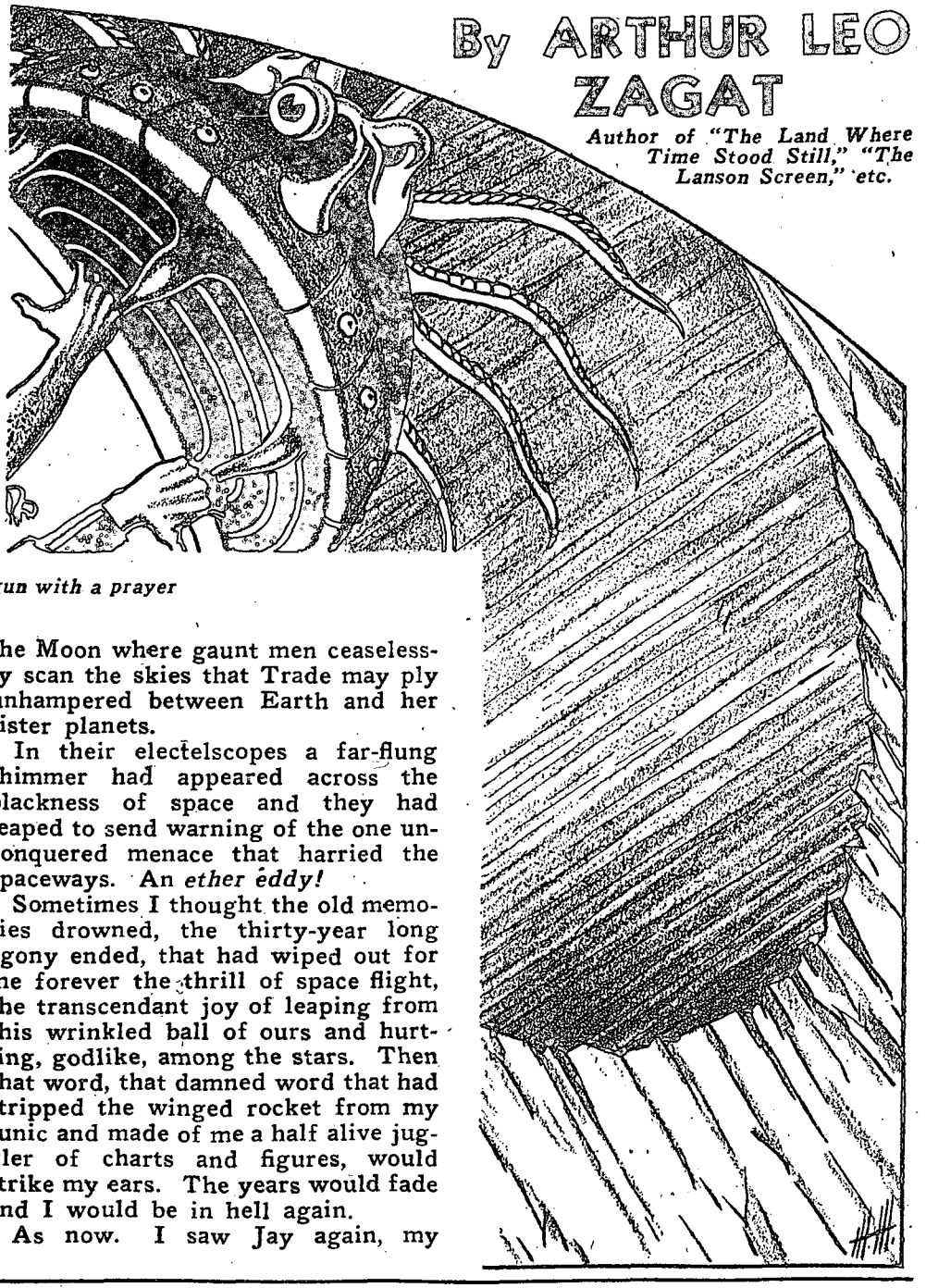
SHINING POOL

By ARTHUR LEO ZAGAT

Author of "The Land Where Time Stood Still," "The Lanson Screen," etc.



gun with a prayer

the Moon where gaunt men ceaselessly scan the skies that Trade may ply unhampered between Earth and her sister planets.

In their electelscopes a far-flung shimmer had appeared across the blackness of space and they had leaped to send warning of the one unconquered menace that harried the spaceways. An *ether eddy!*

Sometimes I thought the old memories drowned, the thirty-year long agony ended, that had wiped out for me forever the thrill of space flight, the transcendant joy of leaping from this wrinkled ball of ours and hurtling, godlike, among the stars. Then that word, that damned word that had stripped the winged rocket from my tunic and made of me a half alive juggler of charts and figures, would strike my ears. The years would fade and I would be in hell again.

As now. I saw Jay again, my

Solve the Riddle of a Hole in Space!

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brother, too poignantly real across the span of three decades. I saw the wide-shouldered, thick-legged bulk of him, a strand of yellow hair straggling over his brow, his broad-planed face flushed with the excitement of his first command. I felt my hand crushed in his own as I wished him the immemorial "Happy landing."

The *Luna's* hatch shut him from my sight. The great craft blasted-off from Earth. The scene shifted. In tortured imagining I bent over an electelscope view field, pride pulsing in my veins as I watched the long, clean arc of his flight. He had learned my teaching well, the bantling. He would push me hard for my laurels as ace of Earth's space fleet.

Then there was that black shimmer across the firmament's spangled black. The *Luna* plunged straight into it—and vanished!

There—where a moment ago she had been, even in her tininess, majestic as a symbol of man's conquest of unimaginable distances, unrealizable cold—there the inscrutable panoply of the stars stared horror at me and only a faint trail of rocket gas, glowing and fading in the vacancy, showed that the *Luna* had ever been.

In the madness that took me, I ripped the insignia of my craft from my blouse and swore that never again should I leave Earth's atmosphere. I kept that oath, but my great need drew me back to this place where the space ships, in ever increasing numbers, leaped for the stars.

Here, while I moldered in the dull routine of my clerk's job, I could watch the swaggering youngsters who wore the winged rocket and pretend to myself that perhaps the next craft to land would bring Jay back to me. Here I had grown old. . . .

THE little hairs prickled on the nape of my neck. The silence about me was eerie, the shadows played tricks on my overwrought nerves. Somehow I felt that I was not alone. And I was afraid.

A furtive sound whispered behind me. My eyes flicked the desk for a weapon, found none. I forced my swivel chair around, every nerve protesting.

A tall figure stood in the dimness near the door, black-cloaked, shapeless. Beneath its black hood was the pale oval of a face out of which eyes glittered, catlike, in some vagrant gleam. The figure was motionless, and all the more menacing because of its immobility. I thought of the lead-capsuled radium in the strongroom beyond my desk, the pellets that multiplied tenfold the power of the oxy-hydrogen mixture in the fuel tanks. Five million solar dollars would not replace them. But what thief would dare the photroncells' spray of death that guarded the treasure?

The intruder moved.

"Who are you?" I rasped. "What do you want?"

A voice came from the shape, a strained, hoarse voice.

"I'm looking for Captain Silton."

Unaccountably blood thumped in my ears. My collar was suddenly tight.

"I'm Silton," I grunted.

"But I mean Gurd Silton, commander of the *Terra*."

Long shivers ran through me, and a mad, impossible thought clamored. That voice!

"I am Gurd Silton," I croaked. "And once I commanded the *Terra*." I was no longer afraid. The ague that shook me was not of fear.

"You—you Gurd Silton!" The other's arm came up. Shrouded by the fabric of his cloak it pointed at me like a bat's wing. "You—impossible. You are an old man, and—"

I heaved from my chair.

"Who are you?" I said. "In God's name, who are you?"

I hurled myself across the space between, ripped the cloak away before he could stop me, jerked the hood from his head. And then I saw him —tousled yellow hair, a long strand dipping across his clear brow; frank grey eyes, small now in puzzlement; broad-planed, youthful face. I saw wide shoulders and thick legs planted in an old, familiar stance. Sound ripped from my throat. *"Jay!"*

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He warded me off.

"I'm Jay Silton, all right. But you're white-haired, wrinkled! You're an old man. You *can't* be Gurd!"

A queer rage thickened my utterance.

"What did you expect? Thirty years don't leave a man's hair black."

And then it hit me! Jay wasn't changed at all. He was still, apparently, a youth of twenty!

He was staring at me with wide, incredulous eyes.

"Thirty y e a r s ," he whispered. "Why, it's only a month since—"

Chaos whirled within my skull. Was I still in the delirium that had followed his vanishment, my long Calvary only a nightmare? I saw the space-chart, saw the date imprinted at its upper edge. November 16, 2048! I pointed to it.

"Look!" I said huskily.

My brother stared at the paper. A vein pulsed in his neck. He drew the back of a closed fist across his forehead and words dripped from his working mouth.

"But I swear it's not a month since we—lost our way. Why, there's still food left on the *Luna* and we had only a month's supply."

His hand came out in a gesture of utter bewilderment.

"Gurd! Where have all the years gone?" His voice was edged with hysteria, a long shudder ran through him. "Sanders is lost," he muttered, "and Hollivant. And there are thirty years gone from my life!"

MADNESS flamed in his eyes. I must ease him somehow, say anything to divert his thoughts from the horror.

"By the way, Jay, I didn't see the *Luna* land. Where is she?"

"Hidden in the Adirondack Pleasure Park, in a glen where nobody goes. I didn't dare land her here."

I was startled.

"Why? Of what are you afraid?" I recalled his furtive entrance, his close-swathed hood cloak and low-drawn hood.

"Afraid? I told you my mates are gone. Have you forogtten Rule Forty-nine?"

A chill ran through me. Rule Forty-nine is the most rigorously enforced of all the Space Code. In case of disaster to a vessel, her commander must be the last to seek safety. If he return minus crew or passengers the penalty is—death in the lethal chamber!

Severe this may be, but justified. Too often, in the early days, did space madness seize crew and master alike. Too often did craft land with one, only, alive of those who had blasted-off. It was the one solution, to place all weapons in control of the master, and hold him straitly accountable for the safety of all aboard.

"Jay!" my voice cracked. "You didn't—"

"No." There was utter truth in the grey eyes. "Of course not."

"But where are they? Are they alive?"

"That's the hell of it, Gurd. I don't know whether they are dead or alive. I don't know where they are."

If I was to help him I must get him talking sense.

"Come now, Jay," I rapped out, sternly. "You must have some idea of where in the universe you have been."

I could see that he was trying to pull himself together, trying to phrase something unphrasable. His hands fisted at his sides. Then, "Gurd! It sounds insane. But—but I don't think it was *anywhere* in the universe."

"What! You—"

Cold, rasping words, interrupted me. Toneless words from across nine hundred thousand miles of space. "Newyork, Newyork, Newyork," the speaker disc above my desk blared. From Lunar Observatory. Ether eddy is fading. Ether eddy is fading. Corrections need not be made. From Lunar Observatory. Newyork, Newyork, Newyork. . . ."

Jay's arms flung above his head, and he shouted incredible things.

"That's where they are! In that eddy or beyond it! That's where I came from. It's going, and my last chance is gone! My last chance to find them, to save them!

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In a flash I knew what must be done. I grabbed Jay's arm.

"Come on, quick!" Without his mates or a witness to his non-culpability for their loss, death was certain for him. "We still have time!" What happened to me did not matter. Hurry!"

We were out of the room, were darting across the tarmac. The *Phobos* loomed its dark bulk over us, and, praise be, its entrance hatch was open. I plunged through, Jay after me.

"Close down," I shouted. "Close down!" The first command of a space flight. How long since I had uttered it!

CHAPTER II

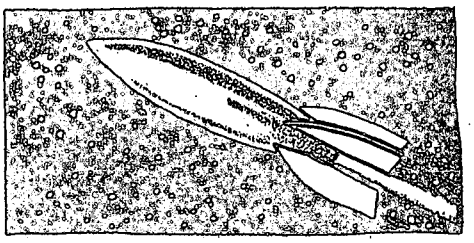
Into a New Universe

I HURTLED up the companionway, followed by the clangor of the shutting air-lock hatch. Thirty years since I had flown, yet all the old, hard won spacemanship tingled at my finger-tips as I burst into the control room and saw before me a gleaming bank of levers and fuel wheels.

Jay's staccato report met me, from the speaker disc above the gauge-board. "All tight, sir." Just as in the years when I taught him the secrets of the void.

"Make it so, mister," I acknowledged in the unforgotten jargon. "Stand by for the blast-off." Not for nothing had I conned the plans of this latest product of the spaceship engineers, assuaging nostalgia in vicarious flight. There was no lost motion now as I dived for the protective couch, snapped straps around me, and jammed down the main-feed lever. I functioned almost automatically, thrown back a third of a century to the old routine.

The surge of sudden vast power, the down-thudding of acceleration's weight, was a trip-hammer blow to my unaccustomed flesh. For an instant I knew the agonies of the damned, then merciful oblivion took me.



I do not know how long I was unconscious, nor what awesome speed the *Phobos* attained before the Thorson electro-spring cut off fuel flow. But when sight and thought returned, I saw, in the visi-screen, the blackness of space, the wide-spread panoply of stars infinite in distance and number that I had thought never to set my eyes upon again, and the ominous shimmer of the ether eddy, straight ahead.

Terror jerked my unwilled hand to the braking valve, but it was too late. The *Phobos* plunged straight into the heart of the mystery from whence my brother had come.

In that instant livid fingers reached, twisting, into my brain!

The *Phobos* jarred. That jar seemed repeated in every atom of my being. Light poured in, a vivid, red light that paled the gleam of our argons, a crimson light that smote all color from the cabin. I whirled to the visi-screen.

And then I was at the lever-bank, furiously, frantically active. I had seen a great orb blotting out the sky, a gigantic, scarlet sphere toward which we hurtled headlong.

The *Phobos* vibrated, screeched protest at the forces that tore at her. Great, whirling, scarlet clouds became distinct, blanketing the strange world that had us in its grip. A craggy spire thrust above the vapor, spearing to impale our vessel.

The nose-tubes were on full force and they couldn't brake her! In minutes, in seconds, we should crash against the red world into infinitesimal fragments. It wasn't thought, it was sheer instinct unforgotten after thirty years that guided my flashing hands among the wheels and levers. There was no time for thought.

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I swung her! I swung the *Phobos* half about as she hurtled to her doom, and with the maximum blast of her main tubes I detoned her into a sideward path, parallel to the rounding surface of the strange planet.

That held her! By the horns of Taurus, that held the craft in a circling orbit, made her a satellite of the cloud-shrouded crimson world!

I slumped, breathless, and stared at the five-fold visi-screen. In one division I saw the mist-clothed, encarnadined bulk of the world whose attraction had nearly done for us. To the side, and far off, an immense sun sent scarlet streamers writhing out from a scarlet, dazzling disc. In the other sectors the firmament was revealed; a black firmament, star-studded. In all that vast panoply of worlds and suns there was not one familiar constellation! They were strange, all strange.

A VOICE, a blessed human voice, broke the stillness.

"Gurd! Are you all right?" Jay leaned against the hatch, his face ghastly in the weird red light, his pupils unnaturally enlarged, the corner of his mouth twitching.

"A little dazed, but whole. And you?"

His lips tried to twist into a smile.

"I? Oh, I've been through this before."

"Then this is what we are looking for. This is where you lost Hollivant and Sanders."

He nodded. "If they're still alive, they're down there. We broke through, like this. Just as you just did, I swung the *Luna* about and forced her into a circling orbit.

"I did more. I turned my ship again, so that her stern was toward that world and tried to blast her away. But I couldn't, Gurd! The attraction was too great. We were held tight."

"But the *Luna* was powered to escape from Jupiter," I exclaimed, "against five times Earth's gravity!"

"It wasn't enough. We were chained here, eternally doomed. I dared not land, not knowing what lay under those clouds and not being equipped for interplanetary exploration. We circled endlessly, seeing below nothing but those rolling mists, now scarlet in the light of the crimson sun, now black as we passed over the night hemisphere. I refused to attempt a landing, hoping reasonlessly that patience would bring release.

"At length Hollivant and Sanders demanded permission to take space suits and make the attempt. I did not feel justified in refusing. I opened the air-lock for them, watched their bulky shapes spiral down, black against the red-lighted clouds, the long-darting flames of their gas-tubes streaming ahead of them to brake their descent. I saw them land on that peak we glimpsed, the only evidence that the strange planet is solid. And then—"

"What?"

"And then the *Luna* jarred. The crimson light was gone, and in the visi-screen I saw Orion with his sword, I saw white Rigel and topaz Betelgeuse blazing in splendor. The white blaze of our own Sun warmed me, and little Earth was a green disc calling me home."

"You had plunged through the ether eddy again!"

"I guessed that. But, Gurd. What does it all mean? What is this strange universe, and what became of the thirty years that seem to me less than a month?"

Somehow I knew the answer, must have reasoned it out subconsciously as he spoke. "Science has moved while you were gone, Jay. We know now that the ether eddy is the manifestation of a fourth dimensional tangency between two spatial hyperspheres.* You remember your high school Einstein, don't you?"

"Of course. I get it. Einstein said space, *our* space, is unbounded but finite, the three-dimensional surface of a hypersphere within which, and without, nothing exists that is in any way related to anything in our space. What's happened is that we've—"

* The figure in four-dimensional geometry that is analogous to a sphere in three-dimensional, i.e., the figure described by a sphere rotated through the fourth dimension, as a circle is rotated through the third dimension to describe a sphere.

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"Broken through into *another* space. Another universe. And since, as you said, nothing in this space has any relation to anything in ours, their Times are different, so that it is perfectly reasonable that while you, here, were living only a month I, there, aged thirty years."

"Yes, but—" He didn't finish his sentence. At least I didn't hear him finish it. For I had kept my eyes on the electelscope viewplate as we talked, and just then, the *Phobos* having completed a circuit of the red planet, the black peak came into its field. And I had caught a flicker of movement on its surface.

IT was an Earthman, his space suit unmistakable! He seemed to be struggling with something. A billow of cloud spurted upward and he was lost to view.

"They're alive," I blurted. "One of them is alive. We've got to go down there."

I managed it. With a gentle side discharge of the rocket flares I changed our level circling to a slow, tightening spiral. Each circuit we made through the shifting changes from black night to crimson day brought us nearer and nearer the clouds, and then after an interminable time, we were among them.

We were through them! We were over a great, almost level plain, black as the belly of Jonah's whale. We landed, gently as thistledown, right at the base of the needlelike spire that pierced the clouds.

"How's that for navigating?" I grinned. "The old boy hasn't lost his skill."

"Swell," Jay applauded. "But what's to do now? We can't climb that mountain. It must be fifty miles high."

"Into space suits," I snapped. "And the *Phobos* carries a small stratocar as a lifeboat. If there's any atmosphere at all, and there must be or there wouldn't be any clouds, that will take us up there quicker than we came down."

"Let's get going then. The fellows need our help, bad."

"We'll get going, but I'm afraid we're too late. Time's all mixed up, Jay, by our circling, but I figure a week at least has passed here since we saw him, although only minutes in the time of this universe elapsed while you came back to Earth and we returned."

"Never mind that. We've got to make a try."

"Okay. I'm with you," I responded. "Don't forget these trinite guns. I've got a hunch we're going to need them badly."

The buzzing hum of the stratocar's hydroxy motor battered against the side of that incredible mountain as we lifted straight up to its summit. Suddenly, just under the cloud ceiling I saw a hole in the rampart, underlined by a narrow ledge. And on that ledge —the broken off hand-claw of a space suit.

"In there! They're in there," I shouted. It was with an effort that I controlled my shaking hand sufficiently to land our little conveyance on the ledge. Bulky in our space suits, we squeezed out, stood precariously on the rock shelf.

The cave that confronted us seemed shallow, a blank wall closed it only six feet back. But a tunnel angled off to the left, so sharply that light, reflected not at all by the dull surface of black rock, did not enter it. My tentative, testing step felt a level floor in that Stygian darkness, and in the sensitive ear of my space suit I heard the scrape of Jay's feet following me.

The jointed metal of my garment made sudden, echoing clangor as I thumped into vertical stone. I froze. Surely that clumsy sound would arouse the mysterious denizens of this cave, would bring them in sudden attack upon us! My hand-fork closed about my weapon's butt.

The stillness was ripped by a long wailing cry, packed with terror; a thin, hopeless, human wail that rose and fell, rose and fell, somewhere ahead! It snapped short. The following, intensified silence was vibrant with horror.

I jumped forward. The ground

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dropped away from beneath me, and I was falling, falling—

CHAPTER III

The Turtle Men

THERE was sound now, sound aplenty. The crash of my own sheathed body, jerking from side to side. The crash of Jay dropping too, above me. Rattle of loosened stones, following us down. I dropped, dropped endlessly.

The sensation of falling ceased, but not the noises. I seemed to be floating free in the eyeless dark. My flung-out hand touched the side wall, was thrust away with terrific force. I knew then that I was still falling, but not at an increasing rate, as I should have if gravity alone were acting. Some intangible force was holding the speed of my descent steady, so that, with nothing by which to judge, I seemed to be at rest.

Precisely as if I were in a spaceship, zipping along at a thousand miles a minute, with nil acceleration. But this was in the bowels of a world, not in the free leagues of space. Sooner or later we'd hit something solid.

The blackness greyed slightly. I felt myself moving upward, slowly. But so sudden a change of direction, at the speed I must have attained, should have torn me to bits. It dawned on me that my fall was merely slowing gradually. Queer! What could be causing this gentle deceleration?

In a sort of drab dusk I could now see the glass-smooth, curved walls blurring past. I twisted and saw Jay's queerly distorted form below—no, above me. It must be above. I had fallen first, and he had not passed me. Sensation was chaotic. As a space pilot I should have been familiar with apparent changes of direction, deceptively due to misinterpretation of changes in acceleration, in rate of motion, by the monitors in our nervous system. But it was so long since I had flown.

The light grew brighter. It was white light. White light! Brighter and brighter it was, dazzling after the dark. Abruptly the walls of the shaft were gone!

We had dropped through the roof of a tremendous cavern, its boundaries miles away! Below, straight below us, five hundred feet or more, a circular pool of what seemed white-hot, shining metal blazed. I glimpsed forms moving about its edges, a road bordering it, low-lying buildings. Beyond them fields, green fields. We were falling straight for that white blaze!

A hurtling form shot sideward, from above me, blue gas spitting. "Gurd. Your gas-tube! Your gas-tube, Gurd!"

Jay's howl shocked me back to thought, to action. I had clean forgotten that this was a self-propelled space suit. My hand-fork flashed to the control button. The death pool jerked away from under me. I thudded hard to the cavern floor, beside the prone figure of my brother. My head rang with the impact, my body felt a mass of bruises, but I was alive!

Jay's helmet was split across the forehead! Was he dead from the fall, or poisoned by unbreathable gases admitted through that ominous tear in his head cover? I rolled to him, peered in through his face-plate.

His eyelids flickered, opened. Color flowed back into his cheeks, and he smiled, wryly.

"I'm all right, Gurd. Just got a rotten crack on the head."

I was nauseous with relief.

"I thought you were gone."

"Not yet. I was born to be gassed out." He sniffed. "I smell flowers. What did you do, lay a wreath on me? A little previous, wasn't it?"

"Your helmet's cracked open."

"Good Lord, but this air is salubrious. Open up and get a whiff of it."

I GOT to my knees, was rigid with dismay. Across the level, grassy meadow from the shining pool a horde of creatures were rushing toward us, things out of some fantastic dream, gigantic in size, of vivid, kaleidoscopic coloring.

As they came closer I saw that they

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were dome-shaped, more like turtles than any other Earth creature. But there was no shell, no tail, and their six unjointed legs were squarely beneath the ungainly bodies. From the topmost point of the hemispherical torsos, a full eight feet from the ground, sprang a series of long tentacles, thin and writhing snakily. In front, fragile-seeming necks jutted, ending in comparatively tiny, globular heads, each featureless save for one unwinking green eye and two drooping, flapped ears.

Before I could move the turtle men closed around us in a jostling, nightmare circle, leaving an open space about twenty feet in diameter. They squashed into one another, seeming to merge in a solid wall of obscene protoplasm, so that we were the center of a serried circle of ball heads thrust out from a high barrier. From that incredible ring came a high, squeaking chorus of whimpering sound, oddly infantile.

I remained kneeling, gaping at that circled horror, could not have moved had I so willed.

The whimpering squeals grew in volume, then ceased altogether. The ring parted, the crowding hosts behind gave way till there was an open lane, stretching back to whence they had come. From the direction of the pool, down that long passage, moving with vast dignity, a little procession came slowly toward us.

In front was a turtle man, similar to those we had already seen, save that his body was a steady blue and that in one of his tentacles there was a bundle of what seemed like long grass which he held aloft and waved slowly from side to side. Behind him, on some sort of discoid platform whose bearers were screened from us by the leader's bulk, lumped another of the creatures.

This one glowed purple, and even from a distance I could see that his legs and tentacles were rudimentary, while the sphere of his head was triple the size of the others'.

As they came on a wave accompanied them in the forest of uplifted tentacles. They came down in evident obeisance, then lifted again to resume their eternal weaving.

I rose and tried to assume what dignity of posture I could muster. The blue turtle man came within the cleared circle of grass land and moved to one side, turning as he did so. And I saw who it was that bore the palanquin of his master.

Their once natty uniforms hanging in torn strips, their faces smeared with dried blood and twisted in agony, their eyes great pits of suffering, the two Earthmen were bent almost double beneath the weight on their shoulders. Hal Sanders' face was seared by two livid welts from ear to chin, and on Ralph Hollivant's chest, where his tunic had been ripped away, another glowed angrily. I felt the hot blood of rage surge into my face. My fists balled within their gloved handforks.

The blue-hued major domo flicked out a tentacle that touched the platform, and then the ground, in an obvious signal. The Earthmen knelt, their necks cording with the effort, and struggled to put the palanquin down evenly.

One side slipped from Sanders' shoulder, thumping against the ground. The prime minister lashed a tentacle across the poor fellow's cheek! Hal's shoulders jerked and I held my breath, thinking he would spring at his tormentor. But, pitifully, his head drooped and all he did was to rub the new mark of punishment with a trembling, grimy hand.

I remembered Hal Sanders as a two-fisted, brawling chap, impatient of discipline. To see him meekly accept the lash told more eloquently than many words what he had gone through, what lay in store for us.

THE enslaved men heaved painfully upright. They looked at us with lack-luster eyes, not the least ripple in their dull faces showing recognition of us, or wonder at our appearance.

"Hal! Ralph!" Jay cried. "What have these devils done to you?"

Hollivant looked at his blue master, appeared to beg voicelessly for per-

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mission to speak.

One of the turtle man's snakelike arms reached out to me, swept shuddersomely over my metal suit, then to Ralph's puffed lips.

Hollivant's voice was almost unrecognizable as human speech. "He wants you to get out of the space suits."

"Like hell we will," Jay blurted. "Let him try to take them off."

"You had better. We tried to defy them, and look at us. They're utter fiends."

Jay's gesture of negation was evidently understood by the weird creature. His tentacle touched Hollivant's lips again, then waved in an all-embracing movement.

"Evidently they don't want another scrap. We did some damage before they got us down. I'm to explain the uselessness of defying them."

"Never mind that," I broke in. "Tell us about this place. With the benefit of what you have learned we may have a chance to get you away."

"Impossible. If you have any weapons the best thing you can do is kill yourselves and us." They were licked, there was no question of that.

"Chin up, Ralph. Arch your back. That way out is always available. Meantime we'll try to make a fight of it. What happened to you?"

"We got down safely enough, landing somewhere on the slope of the mountain through the center of which the entrance to this hell shoots up. Hal took a chance on opening his faceplate, and when we discovered that the air was breathable we decided to signal to Captain Silton. We climbed the peak, keeping on our space suits.

"Just as we reached the underside of the clouds, what I thought was a snake whipped around me and coiled tight. I fought for a long time, there in the red fog, against writhing, snakelike things I could not see. The huge, soft, jellylike bulks gave no resistance as I slashed, and slashed, and slashed in a delirium of struggle. One of my hand-forks struck against rock and broke off, the other was bent and useless. I grew weary, weary, and I could fight no longer. The living ropes clamped tight around me, bound my arms, my legs.

"I was dragged into pitch darkness, and then I was drifting down, slowly down and down till I thought there was no end to descent."

"Slowly? Our acceleration was tremendous at first."

The blue turtle man squealed protest at my interjection, and waved a threatening tentacle. Hollivant winced.

"He's getting impatient. I'll have to cut it short."

"Get the salient facts over. I want to know especially how they get up and down that shaft. I've got a hunch that the solution to our problem lies there."

"Okay. Here's the layout. The outside of this planet is uninhabitable because there are no life-giving rays in the light from its sun. But the pool in this cavern is a basin of highly radioactive liquid that gives off light with all the necessary vibrations at the violet end of the spectrum. As a result, animal and vegetable life has prospered here, their evolution culminating in these highly civilized creatures. Not only does the liquid give off light, but it is also tremendously repellent. Since it is sunk so deeply it acts only upward, more than cancelling the planet's natural gravity."

"HOW do they manage to control that repulsion?"

"They have a compound, a transparent, glasslike sort of stuff, that screens the pool effect. From the nearest building to the pond they swing out leaves of this material, or retract them, so as to moderate the repulsion; allowing it to act full force, or shutting it off entirely. Ordinary gravity acts through this glass, so the effect of covering the pool with it is to permit whatever is in the shaft to fall, instead of rise as it would if the pool were uncovered."

"I get it! By regulating the laminations they control the speed of ascent or descent. That is why we fell so fast at first, then had our speed gradually checked." Many things were clear

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to me now, and already a desperate plan was forming in back of my head.

"They go up there to obtain a certain ore needed in some of their scientific processes. One of their parties discovered and captured Hal and myself. Others must have observed your approach."

"We heard a scream of pain—"

"That was when I got this." He pointed to the scar on his chest. "The hole is a great speaking tube, carries sound perfectly. I heard what sounded like a space suit striking against rock, and tried to call a warning. But I was caught at it." Memory of pain was a dull flame in the lackluster eyes.

"You say they are civilized. The way they have acted to you doesn't sound like it."

"They've outgrown all emotion, except one, loyalty and veneration for their king. He is the be-all and end-all of their economy. At a word from him the whole nation would kill itself."

I had heard enough. "Listen, everybody," I said in a quiet tone, and set out my scheme rapidly and succinctly, gesturing meanwhile so as to indicate to the watching turtle man that although we refused to remove our suits we should go with them peaceably.

At a gesture of command, Hal and Ralph bent to take up their burden again, and Jay and I stepped forward to aid them.

CHAPTER IV

Relativity Reversed

THE turtle king on his platform was unexpectedly light, despite his great size, and the four of us bore him easily, as we followed his adjutant down the long passage that reopened through the compact mass of his fellows. I chuckled grimly when I saw that the path led straight to the edge of the pool.

"The palace," Hollivant whispered, "is on the other side. We will pass the structure from which the screens are swung and then swing around the pond."

Everything depended now on whether those screens were over the pool or not. We slowly neared it, and the brilliant light grew almost unbearable. It blazed through the major domo's body and made of it a huge sapphire jewel. It struck pearly iridescence from the walled bodies lining our course. There was an obscene beauty in the play of color, but my attention was focussed on the great vault of the cavern roof, and, directly over the deep-sunk shining pool, the black hole that betokened the lower end of the shaft.

The procession leader reached the edge of the lake of light, turned ponderously half left to skirt it. His bulk no longer eclipsed my view. I saw the answer to the question that pounded at my brain. Folded up against the wall of a building at our right I saw the transparent screens, towering above the low structure's roof. The pool was unobscured, was free to pour the full strength of its repulsion up through the long vertical tunnel where lay our only way to release.

The blue turtle man was some ten feet ahead of us, the following hosts a respectful twenty behind. It was now or never.

"Ready," I called, quietly, and shifted one arm so that it curled up over the palanquin edge, and gripped the upper surface. The burden jolted, the least bit, and I knew the others had done the same.

"Go!" my voice snapped, and I jumped straight for the center of the pool, still clinging to the turtle king's support. It came with me, as Jay and Ralph and Hal responded to my command. Straight out over that blazing pond we leaped and suddenly we were falling!

Falling! But the pool was above us, and the cavern roof beneath! The repulsion of that pond, taking the place of gravity, had reversed directions for us, and while to the astounded turtle men we were shooting upward to our own senses we were dropping as rapidly.

Straight for the black aperture we went, and a squeal of rage came from

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the palanquin. I looked up at a vast thicket of agitated tentacles and saw a blue mound whirl and scuttle toward the building against which the screens were folded. The prime minister, rushing to cut off the pool's power and bring us back to vengeance.

I jerked out my trinite gun, aimed carefully upward, past my feet, at the huge plates that hung down from the ground. I winged the trinite pellet with a prayer.

It struck, by the Pleiades! It struck squarely on the slowly unhinging screens, and they shattered into a million fragments!

Even above the shattering crash of that destruction I heard a vast high-pitched wail from the tossing multitudes above, and saw them rush headlong into the pool, saw them hurtle downward after us. Then we were in the obscurity of the shaft; falling, falling, falling toward the surface of the red planet.

"THEY'LL blow up the shaft with their bombs," Sanders cried out. "That'll cut off the pool power, and we'll be trapped here in mid-earth."

"They won't do that as long as we have their king with us. I thought they might use some such means of stopping us. That's why I brought him along."

"Gurd!" Jay's voice. "We're accelerating rapidly. We'll crash at the top. Now that you've destroyed the screens there's nothing to stop us except the roof of the entrance cave."

"We'll slow up with our gas-tubes."

"Yeah? And give the turtle men a chance to catch up with us?"

"Pluto! I didn't think of that! Well, it'll be a clean death, anyway." I was licked.

But not Jay. "Try shooting at it," he yelled. "Maybe we can blow off the top of the peak.

"Good boy! Shoot!" We emptied our guns past the discoid resting place of the turtle king. Then we waited with bated breath, as we continued the headlong rise that, to us, seemed a fall. We knew the pellets we had loosed were speeding ahead of us, that they would surely strike the overhanging rock that threatened us. We knew the tremendous atomic power compact in each of the eighth-inch globules. Would it be sufficient to blast away the black peak?

Thunder rolled back upon us, deafening. We were thrown violently from side to side of the shaft as the disturbed air soughed past us, and I heard a squeal of pain from the turtle king. I tried to see past the platform edge, for some gleam of light that would tell me our attempt was successful. But the darkness was complete.

"No go, fellows. We're in for it."

"Good-by, Gurd. It was a grand fight while it lasted."

I reached out, groping, and my hand-fork met Jay's, gripped it hard.

Suddenly I was flung against the underside of the palanquin! I heard a squashing thud, a high-pitched scream, gurgling horribly into silence. I was one of a writhing mass of human arms, legs, bodies, and was joining my voice to a chorus of shouted, husky curses and objurgations. Something was around my neck, holding my head as in a vise. A heel beat a tattoo on the metal of my space suit.

"Hey, let up! Get your toe out of my eye!" That was Jay. I shook my head to clear it of the dizzy whirl that scrambled my brains, realized that we were no longer falling, that we were piled atop the bottom of the platform that had preceded us in all that long descent, that we were miraculously alive!

"What—what's happened?" someone gasped.

"That's easy!" I had figured it out. "The back-flash of the explosion of our trinite pellets against the roof slowed us up a darn sight more than we realized. And the eight-foot mass of jelly the other side of this sedan-chair did the rest. That turtle king made a swell bumper."

"Whew! Let's get out of here. That mob will be on us in a second."

"Gad! I'd forgotten them. How is it they haven't caught us already?"

"The explosion slowed them up

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also. But they'll be here, too quick for comfort."

I PUSHED to the side of the platform, reached around, and got a grip on the under surface. I pushed out under the rocky floor of the tunnel. Instantly directions were reversed. I hung now, from the disc that had just been under me. What was down was now up, up, now down. I knew then that miles of solid ground was between me and the repulsion of the pool, that I was definitely out of the shaft. I let go, dropped, sprawled on solid, grateful rock.

Jay landed beside me.

"Next time I come here," he grunted, "I'm going to paste a label on me, 'This side up, with care.' Am I on my head or my tail now?"

"Hustle," I yelled, and took it on the run. The others were close behind.

Our stratocar still perched, bird-like on the outer ledge. We piled inside. The motor took hold sweetly, and the stratocar zipped out of reach.

The *Phobos*' power was triple that of the *Luna*. She lifted easily through the crimson clouds.

"Where now?" Hal Sanders queried. "How are we going to get back?"

"The same way Jay did, through the ether eddy."

"I suppose you've got a chart of the route," Jay scoffed. "Just issued by the Interuniverse Flying Board."

"I have."

"Quit your spoofing."

"I'm not. The blind luck that attends children and drunks brought the eddy in your path, when you were here before. I, being somewhat more intelligent, know enough to look for it."

"I suppose it's all set for you?"

"Exactly," I responded drily. "There it is, straight ahead. Look."

And so it was, shimmering discreetly, a vague intangible veil across the black curtain of this other-space. But now it breathed promise instead of fear. The *Phobos* plunged straight for its heart.

IN THE NEXT ISSUE

EIGHT DAYS FROM THE HISTORY OF ROCKETS

A Special Article

By WILLY LEY

WORLD'S FOREMOST AUTHORITY ON ROCKETS

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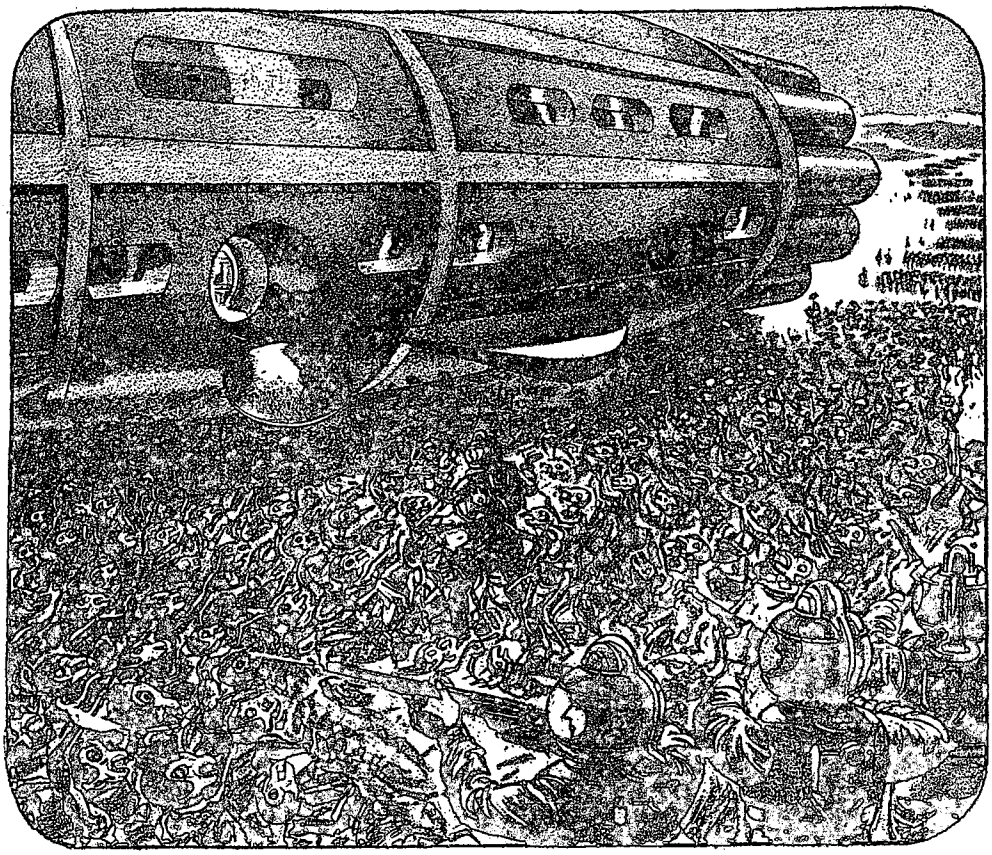

Cruishank kept his two pistols going

Strange Is This Chronicle of Man's First Expedition to an Alien Planet!

By GORDON A. GILES

Author of "Vision of the Hydra," "Dimensional Worlds," etc.

FORTY-NINTH day.

We're on Mars! Landed an hour ago. Mars Expedition Number One transmitting to Earth via Mars etherline. Radio operator Gillway speaking, as usual.

Quite a jolt, the landing. Hull dented but intact. Greaves was knocked unconscious against a wall, but had no bones broken. No equipment damaged.

Here are the details. Cruishank, ballistic expert, plotted the course accurately and we swept past the surface at three miles a second. Then the ship swung, in the grip of Martian gravity, and took up a course as a satellite in the upper fringes of the atmosphere. Cruishank cut the speed, causing the ship to drop gradually, and Captain Atwell pointed out a barren desert as the safest landing field.

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The ship lowered nicely and plowed into the sand rather violently, but not worse than expected.

We all have had enough of the monotony of space with—as Markers put it—its appalling emptiness, frightful blackness and dismal dimensions of eternal depth. We're glad it's behind us—that six-week trip through nothingness.

It is sunset now and in the night Greaves, our chemist, will test the air. Tomorrow morning, if all is well, we will step out on Mars.

Mars Expedition signing off until tomorrow. Fifteen minutes of daily operation, with the tremendous power needed to bridge these millions of miles to Earth, is all our radio batteries can stand.

Regards to the world we have left.

FIFTIETH day.

Captain Atwell, by unanimous vote, was elected to have the honor of first treading Martian soil. Greaves announced the air chemically fit for our lungs but too rarefied for comfort, so we are using the air-helmets on this planet. Captain Atwell left the air-lock alone and stuck the small flagpole into the coarse, ruddy sand, bearing the flag of our native world. Then the rest of us followed him.

Gravity, of course, is ridiculously slight. Swinerton, tall and jerky in manner, overdid his first step outside the ship and executed an incomplete and amusing somersault. The air is cold, being twenty-four degrees below zero Centigrade at high noon. We sally out only in heavy clothing.

Yes, it's queer enough, this Mars. No sign of snow or clouds, nor any of water unless that depression a mile or so away holds some. The cold drove us in quickly. Tomorrow we will discuss a course of action.

* * * * *

Fifty-first day.

Somewhat warmer today, but still below freezing. We are in the southern hemisphere very near the equator of Mars.

Several of the men are eager to get at their pursuits. Swinerton and Dordeaux wish to explore the forest. Parletti, geologist extraordinary, has his pick and shovel out. Alado wants to set up the selenium generators.

Captain Atwell, Cruishank and Markers discussed the matter carefully and decided first to make our habitat more convenient. Beginning tomorrow we will dig out the nose of the ship and move it as close to the pool of water as possible. We plan to establish a headquarters there, as water is our main necessity.

No fauna discovered yet. We saw both moons of this planet last night. There is no way to describe the sensation of seeing two of them, one, Phobos, streaking across the sky like a rocket in the opposite direction of the stars and sun.

All of us are armed with pistols and knives, and Captain Atwell carries a rifle. He will take no chances in this alien environment.

* * * * *

Fifty-second day.

We began working on our new plan today. First we dug out the nose of the ship. Quite a job even though we struck only loose sand as far down as we went. We were all able to work continuously for twelve hours because of the light gravity. Then we had to devise a way to move the ship, which weighs plenty even here on Mars.

Alado and Markers—they make a splendid team—worked out a scheme and started to set up the apparatus before night came. More on that tomorrow.

Saw our first definite signs of animal life today. Swinerton is excited. High above our ship at noon today we saw a bird, or birdlike creature, with an enormous wing spread. It circled around above us in utter silence. Swinerton spent an hour observing it with binoculars, and reports it as feathered. It has a hooked beak, like an eagle's, and strangely, no legs. Apparently it spends its life in the air. We thought that the thin air should discourage flying, but Swinerton put forth the weak gravity as an explanation.

It is night now and the interior of the ship is warm and cozy. Our sun-

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power unit works at about half capacity with the amount of sunlight we get during the day, but it is more than enough to recharge the batteries.

Jupiter is low on the horizon and startlingly bright. In fact, we can make out his disc. And Greaves, who has sharp eyes, claims he has caught glimpses of three of the moons without binoculars. With the glasses we can easily distinguish seven moons.

Earth, naturally, is not in the Martian sky at present, so the last we saw of it was the day before we landed. In about a month, however, Earth will be an early evening star.

Our morale is high. The Martian environment is not any more rigorous than the arctics of Earth, with the one exception of breathable air, but our helmets take care of that.

FIFTY-THIRD day.

We moved the ship halfway to the pool today. We did it by using the long beryllium-alloy bars on which the sun-power mirror rests. First we pounded them into the ground, making a firm anchorage. Then Alado set up two seleno-cells—in this constant sunlight they generate surprising power—and supplied their current to the motor that formerly ran our ship's gyroscope. Then, using pulleys and steel cables attached to the nose rockets, the motor dragged the ship forward over the rolling sand.

Lord knows it would never work on ordinary ground, but with this drifty sand, it was easy. We were able to move the ship twenty-five yards at a time this way before uprooting the poles and placing them further toward the pool. By tomorrow we'll reach the water.

Temperature today is considerably warmer—just about freezing. All day there were a number of those wide-winged birds hovering above us. I hate to say it, but they remind me of vultures. Dordeaux just asked for some music. Can you give us some?

* * * * *

Fifty-fourth day.

Reached the pool all right. Our sun-power unit is broken up, so we are charging our batteries with the seleno-cells temporarily.

We had a surprise today. A sort of "heat wave" seems to have swept down upon us. The temperature was ten above zero. Captain Atwell, fearing that the heat will keep up and melt the lumps of ice in the pool—which, on Mars as well as Earth, must be pure water since saline solutions rarely freeze—ordered all of us to fill the water reservoirs. This we did and we have a large supply now.

This evening Captain Atwell called a general council. For our continued existence, we need two important things which it was impossible to take along from Earth: water, which, however, is a small worry at present; and oxygen, which is running low rapidly because of the constant use of the helmets. Food, of course, we are stocked with for two years. That will easily last until next opposition, as was planned. We have plenty of fuel for the return trip.

The water question will not be seriously considered for a while, but the oxygen can't be neglected. Alado and Greaves are going to work on that problem. Either chemically or electrically, we must have that gas of life.

Markers set up the four-inch telescope this evening and we all took looks at Jupiter and his moons. Saturn is an early morning star but only Markers is staying up to see it. The rest of us will wait until it becomes an evening star.

Dordeaux innocently asked to see the larger moon, Phobos, through the telescope. Markers looked at him witheringly, then invited him to train the tube on it. The way the ship is turned at present, Phobos crosses the left front port only once in seven hours and plunges by in half a minute across the width of the window. So Dordeaux pointed the tube and waited.

Suddenly he tensed and began to wheel the pinion madly, back and forth. When Phobos was out of sight, he turned to the rest of us who had been watching and laughing, and said:

"That's no moon. It's a big firefly out for a speed record!" Deimos, the

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other moon, is not in the sky these nights.

* * * * *

Fifty-fifth day.

Captain Atwell speaking. I wish to inform the Expedition's home staff of scientists, who are patiently awaiting scientific reports from my men, that I consider it our duty to make our position as impregnable as possible before engaging in any concentrative research work. As soon as we have established a permanent camp and worked out a routine of living, I will let the men get at their researches. For the present, however, and perhaps for another week, they will be under my orders. That is all.

Gillway speaking. Alado, Greaves and Markers made crude plans for an oxygen plant here at the pool. Alado promises unlimited electrical power from the seleno-cells. Greaves is working on the electrolysis setup. Markers is devising a collecting and pressure-pump system to store the oxygen in the tanks that have been emptied through use.

Captain Atwell and Swinerton went to the bush forest, a mile away, to get an idea of its outlay. They found it very similar to the bush wilds of our pool and caught glimpses of various forms of animal and bird life. Swinerton is more excited than ever. Mars seems to harbor more of life than Earth generally suspected.

PARLETTI made a momentous discovery today. He was digging in the reddish land near the pool, trying to get an idea of its composition, and noticed that the soil that clung to his shovel dried to a brick in the sunlight. In other words, it is a hard-drying brick clay. The captain was very thoughtful about the matter. I think he's trying to figure out a possible use for the material.

Greaves and Markers started the building of the electrolysis plant at the edge of the pool.

Proosett speaking. Markers and I completed a survey for our geographical position on Mars. Using a meridian in the same plane as Earth's meridian at 6:00 sharp today, Greenwich solar time, we are longitude 16° 17′ 54″, east to west. Latitude from the equator 5° 45′ 15″ to the south. The season here is the wane of summer and logically, then, we are in the warmest spot on Mars. What the temperatures are further from the equator, I shiver to guess.

* * * * *

Fifty-sixth day.

Captain Atwell thought of a use for the clay. Taking advantage of the warm spell we are having—ten to fifteen degrees above zero—he has decided to have a clay house built. The ship, all of us knew without saying, offers very cramped quarters. The captain plans a large, roomy house.

Hods were made and all of us dug and transported clay during the day except Greaves and Markers, who are setting up the oxygen plant. Using the automatic pump that formerly operated the ship's air system, and with power furnished by the seleno-cell that Alado will install, they will compress oxygen as fast as it is formed. They assembled a conglomerate of tubs, glass tubing, platinum electrodes and batteries at the edge of the pool. Water in the form of ice will be dumped into the vats, melted in the sun, and then run into the electrolyzing chamber.

Most of these things are yet in the formative stage. There are difficult details that will have to be solved. When Greaves and Markers left their work at nightfall, they were surprised to see the foundation of the new clay house already installed. Captain Atwell is an efficient taskmaster, and did as much of the work as any of us.

Markers speaking. Made long observations of Jupiter last night and have discovered an eleventh moon. When the new house is finished, I plan to set up the four-inch 'scope on the roof and take photographs of Jupiter, Saturn and the asteroids. I think from this vantage point, Mars being so much nearer these planets than Earth, there will be other discoveries. I'm not positive, but I think I've spotted two new asteroids also. Further observations will bring them out if they're there.

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FIFTY-SEVENTH day.

Gillway speaking. Swinerton came down today with a severe case of bronchitis. Parletti, a first-class doctor as well as a great geologist, tended him and reports no danger.

Captain Atwell is going right ahead with the building of the house and even Greaves and Markers were conscripted to help. The captain says the oxygen plant can wait. He wants to get the clay house up as rapidly as possible, because, as we all realize, if below zero cold sets in again, we will be unable to use the frozen clay.

Atwell left us to ourselves in the afternoon and went hunting. He came back with several of the insect-legged rabbit creatures, which we had tried before and found edible. We were glad to vary our bill of fare with fresh food. Incidentally, it is not meat. In fact, we're inclined to agree with Swinerton who maintains the creature is more insect than anything, and that its fleshy tissue is really insect steak. It tastes like lobster, though Dordeaux insists it tastes like turtle eggs. Anyway, it's appetizing and most welcome.

We've had trouble with our ears, all of us. The diaphragms of our air-helmets, which enable us to project our voices out into the air, vibrate very strongly and our ears are constantly hammered by confined noises. As a result, we go to bed with ringing heads. Markers and I are going to stay up tonight and remedy the trouble. Sound carries well in this atmosphere and we ought to be able to regulate the diaphragm to less volume.

Dordeaux is quite impatient these days. When our ship was landing, he saw, or imagined he saw, a group of man-made habitations beside the line that marked a canal. Naturally, he wishes to scout around for some archeological studies. The captain is adamant, however. We must finish the house and get our oxygen apparatus working.

Those vultures are still flying around in the sun each day, a full score of them. Atwell doesn't like their significance.

"Gillway," he said to me once, "scavengers such as they are never hang around a place that is unlikely to be a hunting ground for some ferocious species of killer. I just wonder what those *other* creatures are."

Well, so far we don't know. Only sometimes I get premonitions and those wheeling vultures above don't help to allay them.

* * * * *

Fifty-eighth day.

Swinerton is on his feet again, but the captain ordered him to stay in the ship. He watched the vultures through binoculars for hours and told us when we came in that the creatures were more insect than bird. Atwell verified his statement that they had membranaceous wings, although their bodies were feathered. Swinerton stated the creature's beak was really a pair of mandibles like those of a warrior ant. All of which makes Martian animal life, as much as we can say at present, a curious admixture of mammalian and insectal attributes, with the insect traits predominating.

The walls of the house are now chest high. Cruishank, who is something of an architect on the side, planned a system of supports for the roof. They will be clay columns set up at strategic places to prevent collapse.

The air in the ship is rather hard to manage now that we've taken out the automatic pump. Every hour or so one of us has to open the oxygen tank and bring the pressure to normal. The carbon dioxide converters, not being 100% efficient, constantly lower the pressure. No real hardship, though.

FIFTY-NINTH day.

Captain Atwell called halt at noon today and set the rest of the day aside as a period of rest. Most of us are rather frost-bitten and worn, so we enjoyed the hours of pleasant conversation and leisure. Thanks for that special program dedicated to us—made us feel—well, very good.

We have set up two seleno-cells just outside the lock for charging the batteries, as one was incapable of doing the work. Alado plans to set the sun-power mirror on the roof of the house

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when it is completed, thus assuring us of plenty of current for a heating plant. But for the present, the much smaller and less troublesome seleno-cells will suffice, especially in this constant Martian sunshine. We have seen no cloud since landing. No doubt we would have to go to the poles to find them.

This pool we are using as a water supply is evidently the remnant of a once much deeper and larger lake. The ages have evaporated it lower and lower, until at present it is highly saline, barely able to support more life than a few acres of desert shrubbery.

We celebrated Armistice Day today by facing to the Martian east. The ties of Earth still bind us, though we are more than forty million miles away.

Your Earth message came in greatly distorted an hour ago. If it is anything important, you will have to repeat.

Now for the last thing of today's log. At sundown, Dordeaux saw three figures standing motionless at the back end of the ship, a few hundred feet away. He dashed in and told Atwell about it, saying that the way they stood and watched indicated some degree of intelligence.

We went out and barely caught a glimpse of the three figures racing away at high speed. The region to the back of the ship terminates in low hills many miles away. What is beyond those hills, we don't know. And from the frown on the captain's face, I'd say he is worried. We are on a strange, new world. We don't know what unknown creatures may be lurking all about us, nor how dangerous they may be.

SIXTIETH day.

Work pushed rapidly on the house. It will be finished tomorrow and we will immediately install the oxygen plant. Once these things are done, we will begin to explore the mysteries of this Red Planet.

Dordeaux is eager to begin a jaunt away from this desert land, to search for lost civilizations. Swinerton is dying to begin a careful survey of fauna and flora. Markers wants to set up the big telescope outside so he won't be limited by the small view from the ship's ports. The same with the rest of us. Ten men eager to catalog Martian phenomena. Captain Atwell himself has a hankering to hike to the nearest canal and see what it looks like.

This evening again, in the light of Phobos, we spied a group of the mysterious creatures of the southland, a half mile away. They are squat figures and do act semi-intelligently in the way they stand motionless, peering at us until our attention scares them away. Their scuttling way of running reminds me of something I've seen before, and when Swinerton, dashing in and out of the ship to get binoculars, announced that they looked like huge *ants,* I knew he was right. But insects half as high as a man! Somehow, they look ominous.

* * * * *

Sixty-first day.

We've had serious trouble, and the future is uncertain for us. This afternoon, while alone in the ship, I heard shouts from outside. I looked out the port. All I noticed in a quick glance was Proosett struggling with several horrible creatures whose powerful mandibles snapped at him viciously. I grabbed up a rifle and dashed out to find the rest of our men shooting into a mass of the attacking creatures. Our bullets won the battle and the attackers fled.

We picked up Proosett, bleeding and unconscious, horribly gashed about the legs. He died two hours later.

Shocked and saddened by this, the rest of us discussed the matter. Beyond a doubt the attackers had been fellows of the insect creatures that had been watching us for several nights. We had seen them closely. They were ants three feet tall, giant insects with the ferocity of tigers. And yet more dangerous than any carnivore because of their prodigious strength and powerful mandibles. We wondered, with fear, if they existed in as great numbers as the ants of Earth do.

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We continued with our work, two of us on constant guard searching the horizon for possible attack.

We finished the clay house and set up the oxygen plant. We have several windows and one doorway, a double air-lock. We have moved our bedding and eating supplies from the ship and taken up quarters in the roomy house. The heating plant of the ship was removed *en masse* and installed, operated by two seleno-cells on the roof. We worked far into the night.

We buried Proosett just an hour ago in the moonlight.

* * * * *

Sixty-third day.

Gillway speaking. I've skipped a day because last night a slight defect of the ether damping unit prevented broadcast. There is much to tell. Yesterday Swinerton came running up from his position at the south of our camp. The insects were coming! It was early morning and we had been engaged in refilling our oxygen tanks. Captain Atwell ordered us all into the house. Then he took a look at the oncoming enemy. When he joined us in the house, his face was grave. They were coming in orderly formation, in rank and file, whole regiments of them.

We watched them through the windows, as they came up. Breaking formation, they scattered about, clashing mandibles, looking for us. Finally, as if ordered by some higher authority, they advanced upon the house and attempted to batter it down. Group by group, they took short runs and tossed their hard-shelled bodies against the walls. Finding this useless, the creatures, seeming to know perfectly well that we were inside, set to work scraping at the walls with their hard-edged jaws.

We began to get worried. In time they would gnaw through the wall at some point, and if we weren't asphyxiated first from lack of sufficient air, would cut us to pieces. It was a grave dilemma.

We had a spare seleno-cell in the ship. Alado explained how we could drive them away—if we could get that generator. From the house to the ship was a distance of thirty yards, swarming with ant creatures. It seemed like suicide, but Cruishank, with a courage as large as his burly body, volunteered to try it. Captain Atwell wanted to go himself, but we overruled him.

Atwell, Dordeaux and Greaves, being the three best shots, covered Cruishank with rifle fire from the outside lock as he made his mad dash to the ship. The ant creatures showed their utter ferocity, leaping at him and at the three marksmen, unmindful of the spitting rifle fire. Cruishank kept his two pistols going and plowed through the insects like a battering ram. The three riflemen held off the insects successfully until Cruishank appeared from the ship, lugging the heavy selenium generator. He could no longer protect himself, but pushed his way to the spot midway between ship and house.

He dropped the generator to the sand, set the rheostat as ripping mandibles tore him to ribbons. Then he

[Turn Page]

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jerked up, waving an arm to us, shouted something, and collapsed. Captain Atwell attempted to rush to his rescue but the other two held him back. It would have been sheer suicide.

We turned away from the sight of Cruishank's body being torn to bits by the vicious enemy. We call it the same on Mars as on Earth—heroism!

Will continue tomorrow—batteries low.

SIXTY-FOURTH day.

The seleno-cell quickly became hot from the sunlight and began generating stored current. As Alado predicted, the immense current, having no outlet from the power terminal, began to send its high voltage sparks into the ground. Immediately the insects, taking this as a challenge perhaps, charged the generator. Then we saw the strangest sight we will ever see. As insect after insect came close to the cell, they took the full charge of the current and died instantaneously from electrocution.

It was fortunate for us that the insects were so utterly ferocious, for instead of avoiding the generator and letting its power dissipate into the ground, they insisted on attacking it in utter abandon until the ground became piled high with their dead. Then, being such good conductors of the current, these bodies absorbed the current and shot it out to their still living fellows.

It became an amphitheatre of blue bolts of electricity, maddened ant creatures, and twitching, burning bodies. Finally they saw the futility of further attack and fled, as many as were yet alive. We dared not go out until the sun set, for the seleno-cell was still operating and generating enough current to kill us all.

That night we heard the tearing of flesh and sinew and the sounds of scuffling. The vultures cleaned the place out for us, leaving not a shred to remind us of the army of dead ants there had been.

Today the ants came again, in still greater hordes. Once more we watched the forces of nature fight our battle for us, heaping the creatures high in death. We are wondering how many more days they will come back. If they come at night, we will be forced to take refuge in the ship, without any heating equipment.

And again tonight the vultures are cleaning the place up for us. We can hear them at work now, with their cruel beaks. We are all a bit nervous. Swinerton has the strange theory that it is the vultures who want us; that if the ants routed us out, they would leave us for the great birds, who rule them.

SIXTY-FIFTH day.

Gillway speaking. Good-by, world! *We are marooned here on Mars!* Today our ship blew up. It is a ruined tangle. The ants came again in such legions that their dead filled the pool and heaped up against our ship. Electricity from our own seleno-cell must have worked through to the metal hull and touched off our fuel reserves. Our only salvation from the insect menace was also our undoing—cosmic irony! The explosion, besides very neatly wiping the place clean of marching insects, stove in one side of our clay house. We managed to repair the breach, working like demons in our air-helmets.

In accordance with our previous arrangement, this will be our last code contact. We have not picked up your Earth messages for a week, and doubt that our own are going through. I will continue, however, to send the click signal every day as per our schedule, at noon and midnight, Greenwich time.

We expect the insects tomorrow. And every day thereafter until either our seleno-cell gives out or the attackers give up. After that, supposing fate in our favor, we will do the exploring denied us so far.

But tomorrow will come the insects, and the next day . . .

All else is the same as ever. So good-by, world! If luck is with us, we will resume radio contact two years from now, at the next opposition.

Mars Expedition Number One signing off.

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ZARNAK

By Max Plaisted

"HARNESSED ELEMENTS"

IN THE YEAR 2937 I, ZARNAK --- AN EARTH SCIENTIST --- FOUND MYSELF ON THE PLANET MERCURY

WITH THE HELP OF ETARRE, A BEAUTIFUL GIRL, I ESCAPED FROM THE DISSECTING ROOM OF A MERCURIAN SCIENTIST. AFTER A NUMBER OF THRILLING ADVENTURES AMONG THE INSANE RACE OF THAT SAME PLANET, ETARRE TOOK ME TO HER FATHER --- VAECO, MASTER OF MERCURY, WHO INHABITED A DEEP MOUNTAIN NEAR THE PERPETUALLY DARK SIDE OF THAT PLANET.

VAECO OFFERED ME REFUGE AT HIS HOME, TELLING ME THAT ME AND ETARRE WERE EXILES FROM THE PLANET VENUS. THEN ONE DAY THE SPACE-TELESCOPE SHOWED TERRIFIC FLOODS FALLING UPON MERCURIAN CITIES. THE WATER FELL FROM THE SKIES LIKE GREAT BALLS! VAECO SENT ME IN MY SPACEPLANE TO SCOUT AND TRY AND LOCATE THE CAUSE. I WAS SURPRISED TO FIND ETARRE HIDDEN ABOARD MY PLANE.

FEARING THE WORK OF OUTSIDE AGENTS FROM ANOTHER PLANETARY SYSTEM, I THOROUGHLY EXPLORED THE STRATOSPHERE ABOVE MERCURY. HOWEVER, I COULD FIND NOTHING. WE THEN FLEW OVER THE FLOODED CITIES

THERE CERTAINLY ARE NO OUTSIDE INVADERS HOVERING ABOVE. THE TROUBLE MUST COME RIGHT FROM THIS PLANET!

LOOK, THAT CITY IS RUINED. THE WATER IS FLOWING DOWN THE MOUNTAIN AND FORMING A LAKE IN THE VALLEY!

WE LEFT THE FLOODED CITIES AND PROCEEDED ON OUR SCOUTING EXPEDITION

LOOK! THAT SAME GREEN MIST IS FORMING OVER THE CITY OF THIAN!

DETERMINED TO SOLVE THE MYSTERY ONCE AND FOR ALL, I DROVE MY PLANE STRAIGHT INTO THE GREEN MIST

SUDDENLY I BEGAN TO FEEL THE EFFECTS OF PRESSURE. ETARRE FELL TO THE FLOOR. --- OUR MERCURIAN ASSISTANTS ALSO FELL, WRITHING IN AGONY

WHAT IS IT?

OH! IT'S UNBEARABLE!

YOU MUST DO IT, ETARRE. THEY WILL OBEY ONLY YOU!

PEOPLE OF THIAN! EVACUATE YOUR CITY AT ONCE. A GREAT FLOOD THREATENS. THE SUPREME ONE COMMANDS YOU TO LEAVE IMMEDIATELY!

I FLASHED A MESSAGE TO VAECO TO PREPARE THE BIG DIVING BELL USED IN THE LAKE IN THE HOLLOW MOUNTAIN. THEN I HEADED MY PLANE BACK TO VAECO'S HEADQUARTERS

[Turn Page]

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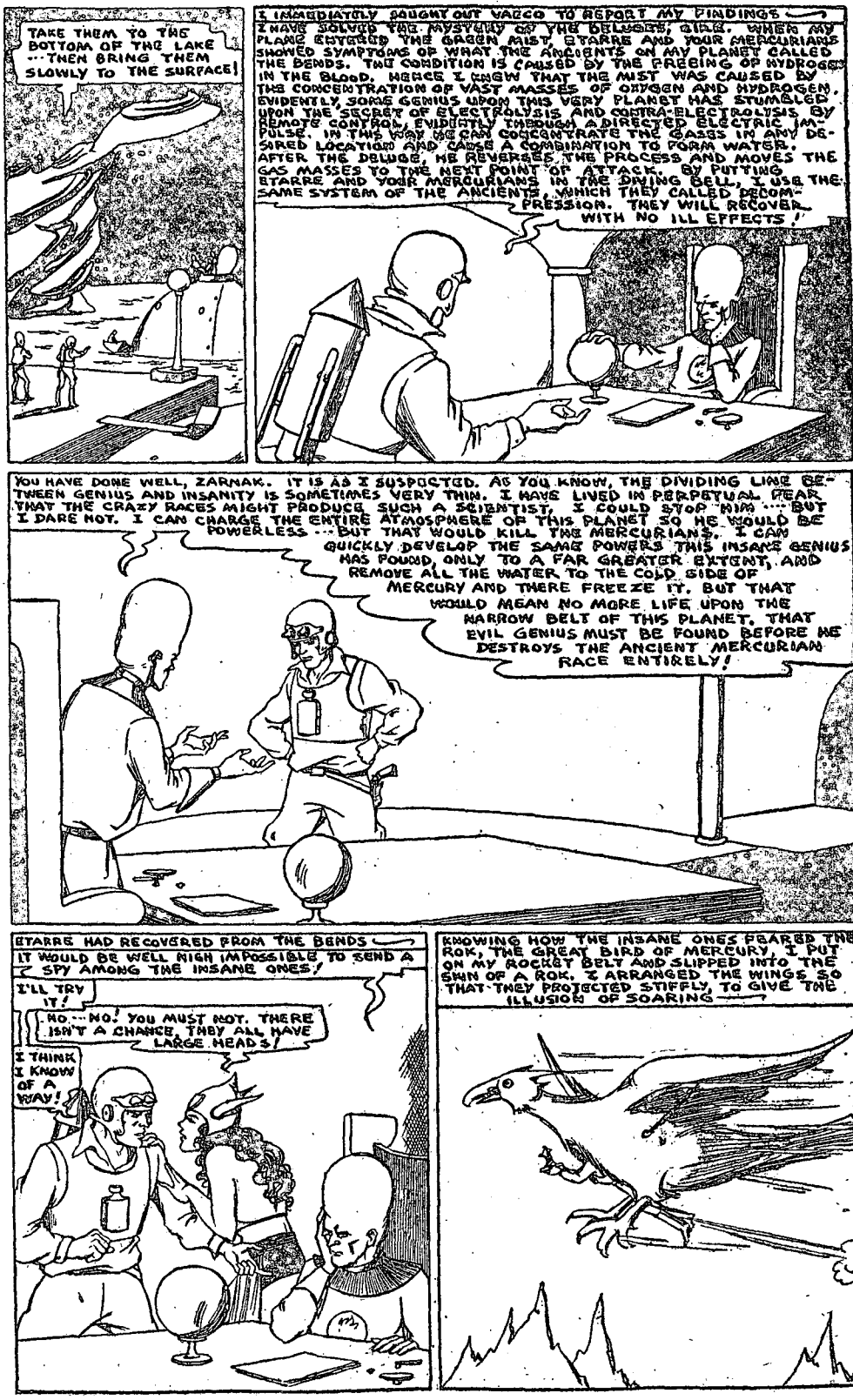
TAKE THEM TO THE BOTTOM OF THE LAKE ··· THEN BRING THEM SLOWLY TO THE SURFACE!
I IMMEDIATELY SOUGHT OUT VACCO TO REPORT MY FINDINGS ···
I HAVE SOLVED THE MYSTERY OF THE DELUGES, GIRL. WHEN MY PLANE ENTERED THE GREEN MIST, ETARRE AND YOUR MERCURIANS SHOWED SYMPTOMS OF WHAT THE ANCIENTS ON MY PLANET CALLED THE BENDS. THIS CONDITION IS CAUSED BY THE FREEING OF HYDROGEN IN THE BLOOD. HENCE I KNEW THAT THE MIST WAS CAUSED BY THE CONCENTRATION OF VAST MASSES OF OXYGEN AND HYDROGEN. EVIDENTLY, SOME GENIUS UPON THIS VERY PLANET HAS STUMBLED UPON THE SECRET OF ELECTROLYSIS AND CONTRA-ELECTROLYSIS BY REMOTE CONTROL, EVIDENTLY THROUGH A DIRECTED ELECTRIC IMPULSE. IN THIS WAY HE CAN CONCENTRATE THE GASES IN ANY DESIRED LOCATION AND CAUSE A COMBINATION TO FORM WATER. AFTER THE DELUGE, HE REVERSES THE PROCESS AND MOVES THE GAS MASSES TO THE NEXT POINT OF ATTACK. BY PUTTING ETARRE AND YOUR MERCURIANS IN THE DIVING BELL, I USE THE SAME SYSTEM OF THE ANCIENTS, WHICH THEY CALLED DECOMPRESSION. THEY WILL RECOVER WITH NO ILL EFFECTS!
YOU HAVE DONE WELL, ZARNAK. IT IS AS I SUSPECTED. AS YOU KNOW, THE DIVIDING LINE BETWEEN GENIUS AND INSANITY IS SOMETIMES VERY THIN. I HAVE LIVED IN PERPETUAL FEAR THAT THE CRAZY RACES MIGHT PRODUCE SUCH A SCIENTIST. I COULD STOP HIM ··· BUT I DARE NOT. I CAN CHARGE THE ENTIRE ATMOSPHERE OF THIS PLANET SO HE WOULD BE POWERLESS ··· BUT THAT WOULD KILL THE MERCURIANS. I CAN QUICKLY DEVELOP THE SAME POWERS THIS INSANE GENIUS HAS FOUND, ONLY TO A FAR GREATER EXTENT, AND REMOVE ALL THE WATER TO THE COLD SIDE OF MERCURY AND THERE FREEZE IT. BUT THAT WOULD MEAN NO MORE LIFE UPON THE NARROW BELT OF THIS PLANET. THAT EVIL GENIUS MUST BE FOUND BEFORE HE DESTROYS THE ANCIENT MERCURIAN RACE ENTIRELY!
ETARRE HAD RECOVERED FROM THE BENDS ···
IT WOULD BE WELL NIGH IMPOSSIBLE TO SEND A SPY AMONG THE INSANE ONES!
I'LL TRY IT!
NO ··· NO! YOU MUST NOT. THERE ISN'T A CHANCE, THEY ALL HAVE LARGE HEADS!
I THINK I KNOW OF A WAY!
KNOWING HOW THE INSANE ONES FEARED THE ROK, THE GREAT BIRD OF MERCURY, I PUT ON MY ROCKET BELT AND SLIPPED INTO THE SKIN OF A ROK. I ARRANGED THE WINGS SO THAT THEY PROTECTED STIFFLY, TO GIVE THE ILLUSION OF SOARING ···

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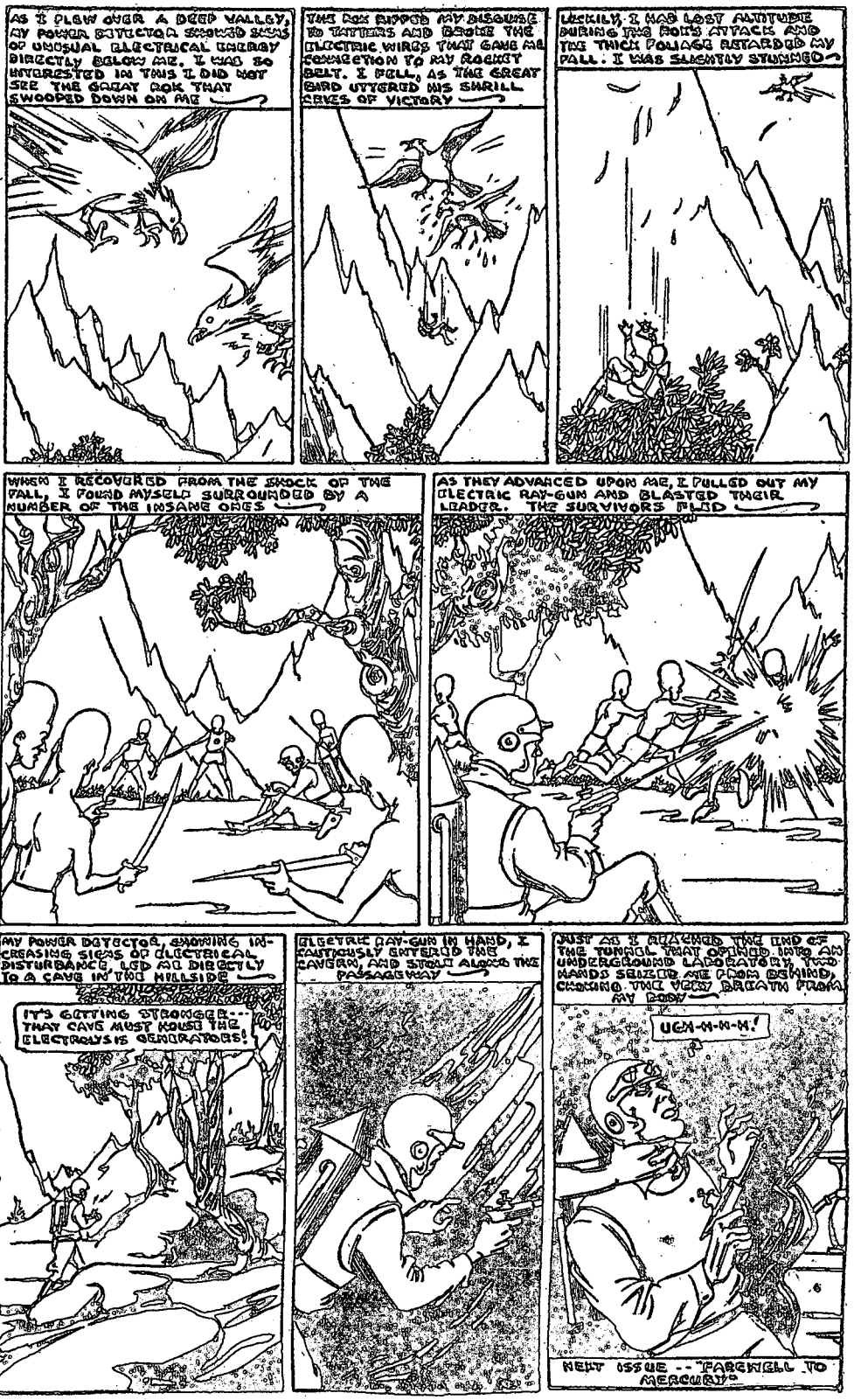
AS I FLEW OVER A DEEP VALLEY, MY POWER DETECTOR SHOWED SIGNS OF UNUSUAL ELECTRICAL ENERGY DIRECTLY BELOW ME. I WAS SO INTERESTED IN THIS I DID NOT SEE THE GIANT ROC THAT SWOOPED DOWN ON ME
THE ROC RIPPED MY BESOURE TO TATTERS AND BROKE THE ELECTRIC WIRES THAT GAVE ME CONNECTION TO MY ROCKET BELT. I FELL, AS THE GREAT BIRD UTTERED HIS SHRILL CRIES OF VICTORY
LUCKILY, I HAD LOST ALTITUDE DURING THE ROC'S ATTACK AND THE THICK FOLIAGE RETARDED MY FALL. I WAS SLIGHTLY STUNNED
WHEN I RECOVERED FROM THE SHOCK OF THE FALL, I FOUND MYSELF SURROUNDED BY A NUMBER OF THE INSANE ONES
AS THEY ADVANCED UPON ME, I PULLED OUT MY ELECTRIC RAY-GUN AND BLASTED THEIR LEADER. THE SURVIVORS FLED
MY POWER DETECTOR, SHOWING INCREASING SIGNS OF ELECTRICAL DISTURBANCE, LED ME DIRECTLY TO A CAVE IN THE HILLSIDE
IT'S GETTING STRONGER-- THAT CAVE MUST HOUSE THE ELECTROLYS IS GENERATORS!
ELECTRIC RAY-GUN IN HAND, I CAUTIOUSLY ENTERED THE CAVERN, AND STOOD ALONG THE PASSAGEWAY
JUST AS I REACHED THE END OF THE TUNNEL THAT OPENED INTO AN UNDERGROUND LABORATORY, TWO HANDS SEIZED ME FROM BEHIND, CHOKING THE VERY BREATH FROM MY BODY
UGH-H-H-H!
NEXT ISSUE -- "PARNELL TO MERCURY"

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WHEN the EARTH LIVED

A Super-Universe Unleashes Forces that Create New, Sentient Life!

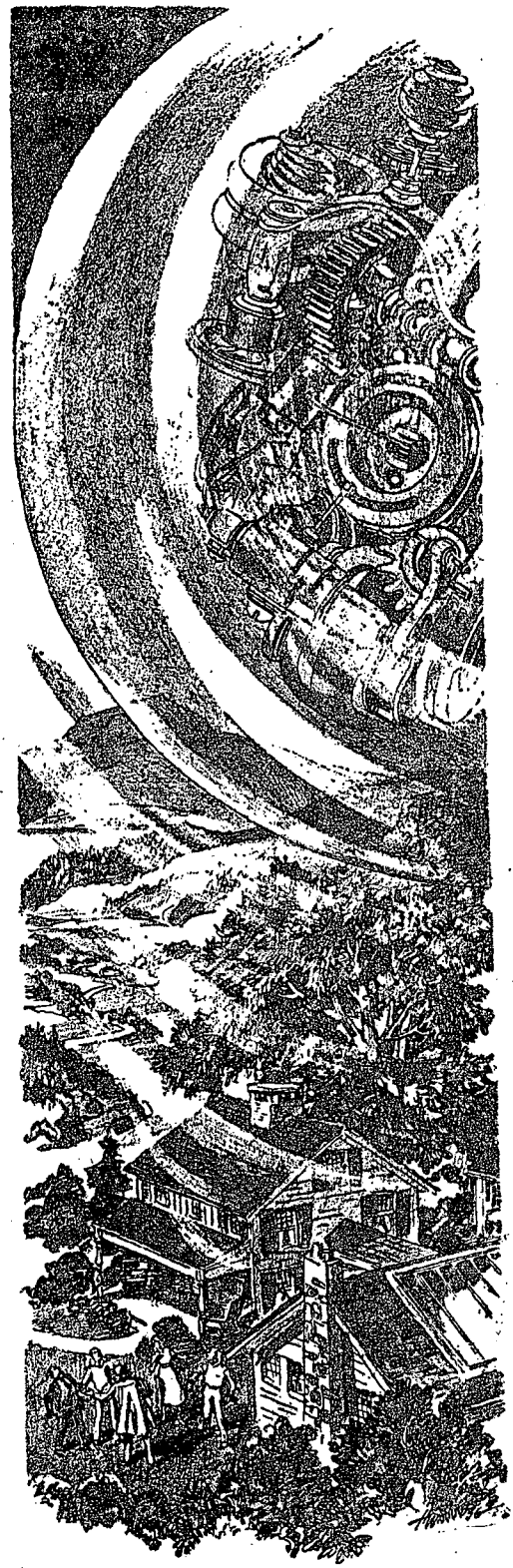
By

HENRY KUTTNER

Author of "Four Frightful Men," "Terror in the Night," etc.

WHEN Jim Marden discovered that the Universe had apparently gone insane, he was already on his way to the mountain home of Dr. Leon Kent, his uncle and sole living relative. An urgent, cryptic telegram from Kent had caused Marden hurriedly to pack a bag, throw it in the back of his roadster, and start the long drive to Coon Mountain, where his uncle had his home and laboratory. Snatching a hasty meal at a roadside stand, he glanced over a newspaper and saw the first warning of the disaster that was to become cosmic in its scope.

If Marden hadn't been somewhat of a scientist, in his amateur way, he would scarcely have realized the tremendous potentialities behind the news item on Page 6. It was brief enough, stating only that according to a dispatch received from the Mount Wilson observatory, N.G.C. 385, a nebula in the Pegasus cluster, had stopped its race away from the earth



The sphere leaped up to the horizon

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at a velocity of 2,400 miles per second, and was darting with even greater speed at right angles to its former course.

The layman might have passed over the item unperturbed, but Marden knew that when a thing like that can happen, science loses its sanity and becomes an avocation for madmen.

A girl sitting near him at the counter called to the waiter. She held up a spoon—or what must have been one once. Now it was only an oddly malformed bit of metal.

"What do you call this?" she asked.

The waiter, apologizing, gave her another spoon. In a moment Marden had forgotten the incident. Obviously it was ridiculous to connect a suddenly insane nebula with the curious malformation of an ordinary spoon. Yet the two incidents were related, Marden was later to realize—and so, likewise, was the remarkable incident of the coffee urn.

Marden wasn't looking at the big, silvery urn at the time, and his first realization of anything wrong was a sudden hiss and a splash from beyond the counter, and an astonished cry from the waiter. He glanced up, and saw a deluge of brown liquid pouring from the bottom of the urn. In a moment the floor within the U-shaped counter was flooded. The waiter bent to turn off the gas, and suddenly froze, his bulging eyes staring up at the bottom of the urn.

"Well, I'll be—" he exclaimed. "I never seen a thing like this before."

"What?" asked the girl who had wanted another spoon. Marden noticed that she was rather lovely, with greenish, glowing eyes, and a somewhat pert nose. A young man sitting beside her, blond, handsome, of the matinee idol type, added: "The place'll be falling apart next, Lorna."

The waiter turned a puzzled face to Marden.

"Funny," he said. "Looks like the metal had simply curled back out of the way of the flame. There's a ring of it—not melted, but curled back—all around the hole in the bottom."

"Maybe it didn't like the fire," the blond youth said, with unintentional accuracy. The waiter shot him an unpleasant glance.

The girl got off the stool, and her companion threw a coin on the counter.

"When does the bus leave?" he asked.

A grin appeared on the waiter's face.

"It's left," he said with relish. "Won't be none till tomorrow now."

"But we've got to get to Carr City," the boy exclaimed. "There's no place to stay here, even if—"

Marden said the obvious thing.

"I'm going almost to Carr City. I'd be very glad to give you a lift."

"Thanks," the boy accepted eagerly. The girl hesitated, but nodded at last. Marden got off the stool, spinning a half dollar on the counter, and stumbled, nearly falling.

"That's funny," he commented, grinning wryly. "Felt like the floor gave way beneath me." Indeed, there had been an odd sensation of—*life*—in the wooden floor, almost as though it had actually moved beneath his feet. He glanced down, noting that the cracks in the wooden planks seemed awry, as though warped and twisted. They seemed to move as he watched, writhing back to their original position. Marden blinked. An optical illusion, he concluded.

NEARLY two hours later the roadster was laboring up the slope of Coon Mountain. Half a mile ahead, across a canyon, Marden could see the bus his guests had missed. His eyes kept returning to it, despite the dangerous curves of the mountain road. There seemed something distinctly unusual about its method of progress. It seemed to move forward jerkily, apparently leaping a few feet occasionally into the air; at any rate, Marden was sure that sometimes he could see the bus wheels clear of the road.

He wondered what was the matter with him. Perhaps he was becoming ill, even the little roadster seemed difficult to handle today. It did not respond readily to his hand on the steering wheel, and he had a curious and inexplicable feeling of uneasiness.

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For some unknown reason, he felt glad that he was not in a closed car.

His guests, apparently, noticed nothing unusual. The boy—Bob Harrison—had driven the girl, Lorna Newton, to Los Angeles to attend a football game, and on the way home his car had broken down.

"The garage was swamped," Harrison told Marden. "An epidemic of accidents, it seemed. Lorna has to get back to work by tomorrow morning, and I've got to get back to the university."

"Well," Marden said. "I'll catch up with the bus and put you on it. I was supposed to turn off here—" He gestured toward a half-hidden road that branched off just ahead among the pines. "But I can come back to it. I'll be up with the bus in a few minutes."

Luckily, he wasn't. The catastrophe happened just as Marden was at the hairpin turn of a narrow canyon. A hundred yards ahead he saw the bus, a double-decker affair of blue paint and chromium. Abruptly the world went crazy.

The road just ahead seemed to buckle, to leap up at an impossibly steep angle, so that the bus began to slide back. Automatically Marden jammed on the brake, sat staring.

"Earthquake!" Harrison gasped.

But it wasn't. The asphalt road fell away from beneath the bus, and the vehicle smashed down with a metallic crash. The tires blew out with a deafening report. From within the bus came screams—agonized, terrified.

For the bus was—collapsing! It was folding inward upon itself, as though it were being crushed in the grip of some giant hand. Glass shattered. The windows, instead of squares, became oblongs—became mere slits until they disappeared as the metal fused.

"Good Lord!" whispered Marden. "Look at the road!"

Beneath the bus the asphalt was curling up, and the vehicle was sinking slowly from sight. It was as though the road had suddenly turned into a sea of sucking mud, dragging the bus inexorably down. A pandemonium of shrieks came to Marden's ears. He saw a squat, bulky figure writhing into view from a window that narrowed as he watched.

The man squirmed frantically for a moment; then he was free, and the metal coalesced behind him. He came racing toward the roadster, his mouth open in a frenzied oval of terror.

The bus was now nothing but a long ovoid of smooth, glistening metal. It shrank, became a sphere a fifth of its former bulk. The screams had stopped.

It sank from view. The asphalt engulfed it.

THE squat man was plunging desperately down a road that swayed and buckled beneath him. Abruptly Marden sent the roadster rocketing up the slope at the side of the road, felt solid earth giving like sand beneath the car. He raced the motor and managed to pull free, got the roadster faced in the other direction. The squat man came abreast of the car, leaped to the running-board as Marden beckoned. A grinding unearthly roar was coming from the ground beneath them.

Marden jammed his foot down on the accelerator. He felt the little roadster sway dizzily, tilting dangerously toward the precipice on the left. But the car's speed carried it safely down the road. He caught a glimpse of Lorna's face, strained and white.

The squat man shouted something, scrambled frantically for footing. He managed to pull himself up on the body of the roadster, opened the rumble seat, and tumbled in. Glancing down, Marden realized that the running-board had vanished. There was a thin strip of oddly blackened rubber running along the side of the car where it had been.

Still the road swayed beneath them. Marden wrenched at the steering wheel, sent the car racing up the road that led to his uncle's home. They topped the crest of a hill, and a little valley came into view, in which a ramshackle frame house was set. There was an odd flickering in the air about the house.

"The car's falling apart!" Harrison shouted above the grinding uproar

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that thundered from the earth. The door of the car at Harrison's side was gone; white-faced, he clung to the windshield, and it seemed to melt and disappear as he clutched it. A blast of wind hit Marden's face.

The steering wheel came off in his hand.

Luckily, the road was straight. He saw a tall figure come running from the frame house, pause for a moment, and then retreat quickly. The inexplicable flickering in the air about the building faded, was gone. Marden pressed the brake and eased the car to a stop. It skidded, turned half around and paused in the middle of a garden.

Above the rumbling of the earth a high-pitched whine sounded, grew louder. The flickering in the air began again; but now it was beyond the roadster and its shaken occupants. It was as though an invisible wall of strange force enclosed the house, guarded it.

Shakily Marden got out of the car, helped Lorna to alight. Harrison and the squat man hastily followed his example. They looked at each other silently. There didn't seem to be much to say.

Someone came out of the house, a gaunt, slender man, with ascetically handsome features. His age was betrayed only by the streaks of white at his temples.

"Uncle Leon!" Marden said, and paused lamely. "I—we—well, I got here!"

"So I see," Dr. Kent said drily. "Come in the house, all of you, and have a drink. You need it."

DR. KENT explained as he worked. He talked to them while peering into a microscope and making hasty calculations on sheets of paper that littered the laboratory table. The others sat around uneasily, watching him. Harrison and Lorna sat close together on a bench, and Marden leaned against the wall, biting nervously at the bit of his pipe. The squat man was Stan Burford, a promoter on a vacation. He sat rigidly on the edge of a chair, his unintelligent face bearing a look of stupid fear. Just what he promoted he never made quite clear. Marden decided that the man was a petty gambler.

Dr. Kent, still calculating busily, turned the screw of the microscope.

"I did not think it would come so quickly," he said. "I believe this is the only place on Earth where we are reasonably safe. The flickering in the air you noticed, Jim"—Marden had already mentioned this—"was due to a death ray I've adapted. It surrounds us, like a hollow globe of force. Or, rather, of annihilation. If I hadn't seen you coming, and turned it off temporarily, you'd have been killed."

Lorna repressed a shudder.

"I didn't know death rays existed," she said.

The doctor stared at her.

"My dear girl, death rays are no longer pseudo-science—they're cold fact, as you'd know if you read the scientific journals—even the newspapers. I've simply adapted the ray to my own uses. It acts as a barrier to—to—" He hesitated.

"I think I have an idea of what's wrong," Marden said. "That nebula in Pegasus gave me the clue. It's something—cosmic—isn't it?"

"Yes. An experiment, Jim—a cosmic experiment, in which we are the subjects—the guinea pigs. You know the atomic theory, of course?"

"That this Universe is merely an atom in a larger Universe, and so on, to infinity?" Marden asked. The doctor nodded.

"That's right. An old idea, of course. It's served as the basis for innumerable pseudo-scientific stories, and, actually, it's generally taken for granted by the world of science. But—you know what I've been working on for years, Jim, don't you?"

"Rays," Marden said. "Yes. Especially the cosmic ray. You don't mean—"

"Exactly. The cosmic ray put me on the track of the truth—a truth so unbelievable, so strange, that I dared not announce my discovery. I'd have been laughed at, and worse. Perhaps put in an asylum. And I needed my freedom to complete my work. Whether it will do any good now—"

"The closest guess scientists have

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made as to the nature of the cosmic ray," Kent went on, "is—life. And that's just what it is. For ages men have tried to create artificial life in the laboratory. All the while, they have neglected the most important factor—the cosmic ray itself, which is the source of life. All through this universe the ray has spread. And very slowly, very gradually, it has increased in power."

"BUT the Arrhenius theory—" Marden began.

Kent interrupted him.

"It doesn't conflict. Life spores can float from world to world—yes. Nevertheless, in the beginning, life was generated by the action of the cosmic ray. No one has guessed its source. That's because it comes from *beyond* the universe—from the super-world in which we are merely an atom.

"I can best make you understand by choosing familiar examples. Let us suppose that a scientist has discovered a ray which creates life. He is experimenting with the atom. He turns this ray upon an atom—an extremely complex one—under his microscope. He creates life.

"But he is not content. He wishes to experiment further. He increases the power of the ray. And life—"

Marden gasped. "You mean that in this super-universe—but it's impossible!"

"Not at all! For that's exactly what has happened. In the super-universe, the cosmic ray has been increased in power by the Scientist—Scientists, rather—who are experimenting with the atom in which our world exists. Soon I shall show you how I know this, Jim. Do you know what life is?"

"I know that," the blond Harrison said. "Life is adaptability and growth."

Dr. Kent snorted. "These college students! Those are merely the attributes of life. A living organism can adapt itself to its surroundings—and it can grow. But what is life itself?"

"No one knows that," said Marden.

"Quite right. And the common error of the world of science is that it confines life to organic matter. Rocks, they say, cannot live. Metal cannot live. Atoms cannot live. Yet you saw those things alive this morning!"

"What?" Marden frankly stared. For a moment he had a fleeting suspicion that his uncle had gone insane. "It's impossible!"

"Don't keep saying that! Ordinarily, yes. The power of the cosmic ray—the *life ray*—at first gave life to only those elements which could readily acquire it—organic entities, protoplasm, evolving to man. Now that the cosmic ray is stepped-up, the mysterious life force is spreading to all things throughout the Universe. Adaptability—and growth!"

"The coffee spoon—" Lorna whispered.

They had told Kent of the incident in the roadside restaurant.

"Yes," he affirmed, nodding. "The heat of the coffee made it coalesce into a form in which it would feel less warmth than in its original shape. And the coffee boiler—the metal *did* curl out of the way of the flame. We can't foresee what may occur—inorganic life is so alien to ours. The weight of the bus perhaps caused the catastrophe on the road. The earth itself is growing and adapting itself. It is becoming alive."

"He's crazy," the stocky Burford whispered to Harrison. But the college boy shook his head impatiently, waiting for Dr. Kent to continue.

"The—infection—is s p r e a d i n g slowly, of course. As yet Earth feels only the first birth pangs. Later only the Lord knows what will happen. In this one spot, protected from the accelerated cosmic ray, are we temporarily safe. But—" He shrugged.

"Somehow I can't really believe it," Marden said slowly. "It seems too—incredible. I've always been taught that life is limited to organic matter."

"How can anyone know that, when no one knows what life is? Look here, Jim—and the rest of you."

DR. KENT arose, and went to a table nearby on which a bulky, unfamiliar apparatus rested. A metallic screen, about two feet square, surmounted the strange machine. Kent pressed a button. Flashing light

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played over the screen.

"I'll show you the super-universe," he said. "I stumbled on this during my experiments. It is a rather simple principle; I utilize the cosmic ray itself as a carrier to a visual beam, sent in the opposite direction. Outward. The peculiar properties of the cosmic ray make this possible. Without it, naturally it would not work."

The flickering lights faded from the screen. A scene materialized into view, dim, greyish. Involuntarily Lorna cried out, clapped her hands to her eyes. A sharp twinge darted through Marden's head as his eyes tried to follow impossible curves and angles. Unfamiliar, alien objects were visible—things that seemed to be constructed according to a fantastic, non-Euclidean geometry.

Strange curves twisted and writhed into impossible angles. Only in the center of the screen was the image clearly defined. Yet Marden could not understand what he saw.

A machine—yes. That he knew. But it was not akin to any machine he had ever seen. It was built of crystal, planes and spheres impinging, somehow, upon a single point where a spot of light glowed vividly—blazing light, blinding and unearthly.

"The origin of the cosmic ray," Kent whispered, "is in that super-universe. You are looking at our own cosmos from—Outside!"

Something swam into focus—a slender, rodlike object, glowing with emerald brilliance. It hovered over the spot of light and retreated.

"I think—I am not sure—I think that is one of the Scientists," Kent said under his breath. "Watching the experiment that means destruction to mankind."

"Incredible!" Harrison exclaimed. Burford, the promoter, was muttering something inaudibly.

"It is immaterial to me whether you believe or not," Kent said coldly. "I —know. And that is enough."

"But what can we do?" Marden asked. "This means destruction. There's no way—"

"There is a way," Kent told him. "It's a way which I've been planning ever since I got on the track of this, years ago. If that super-microscope can be destroyed, shattered—"

Involuntarily Marden laughed, a short, bitter bark. His uncle raised his eyebrows.

"Still skeptical, eh? Let's return to our original comparison—our scientist, experimenting with an atom. Just suppose that some explosive compound far more destructive than dynamite were introduced under the lens of the microscope—and exploded."

"Wouldn't it wreck the atom?" Harrison asked. The doctor glared at him.

MARDEN interrupted. "No," he said. "It'd probably blow up the microscope and the laboratory—but the atom wouldn't be hurt, naturally. Far too small."

"Exactly," the doctor affirmed. "Well, that's my plan. That's what I've been working on for years. And it's almost completed. I'm going to send a sphere packed with that new explosive, thernolyn, into that super-universe—and make it wreck the microscope and the machine that generates the cosmic ray!"

Stunned by the magnitude of Kent's plan, Marden could only stare. The doctor went on swiftly.

"Again I shall use the cosmic ray as a carrier beam. The thing is far too complicated to explain, nor have I time. For three months now I have been working on the final problem—timing the explosion so that it will occur at the right moment. The strength of the cosmic ray will naturally be much more powerful at its source. My calculations are based upon that. I'll let the ray itself explode the thernolyn. Jim—I'll need your help. The rest of you can do as you wish. But don't go near the death ray barrier!"

"Can I help?" asked Harrison. The doctor grunted unpleasantly.

"By keeping out of my way, yes. Jim, here, knows little enough, but he has the rudiments of scientific knowledge. The rest of you—"

With a shrug he turned back to his microscope, beckoning to Marden. With a reassuring smile for Lorna, Marden picked up a pencil and moved to his uncle's side.

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The launching of the thernolyn sphere was unspectacular. The object was a glistening, metallic ball, about a foot in diameter, within which Dr. Kent had constructed the machinery which would send it into size. The liquid thernolyn was at the last moment poured into a valve in the side of the ball, and Kent, after a hasty reference to his sheaf of calculations, touched a protruding lever.

Very slowly at first the sphere began to increase in size. In a second it was two feet in diameter—three—eight—

It became tenuous. Dimly within it Marden glimpsed a complicated array of machinery, the glistening, whitish thernolyn. Then suddenly it seemed to leap up, towering to the horizon, a hazy ghost of a sphere. Marden seemed to be within it for one amazing second. It dwarfed the most colossal structure man had ever reared—

And it faded and was gone! Into size—rushing at stupendous speed toward the super-universe, bearing its cargo which meant salvation for Earth!

"Will it really have any effect?" asked Lorna. "A mere shadow—"

"It'll be real enough—Outside," Marden said. "As it grew the atoms making up its structure expanded, naturally. But if it reaches the super-universe, it'll be quite as dense as the matter there. How long will it take, Uncle Leon?"

Dr. Kent pursed his lips.

"I'm not sure. There are so many loopholes, so many chances for error. Possibly in an hour. You see, its speed—its rate of growth—is increasing continually. The time-rate Outside is no doubt different—an hour to them might be a million years to us. Indeed, that's the only reason I had time enough to make my preparations."

"THERE'S nothing to do but wait, then," Marden told Lorna. "I wish I knew what was going on outside this valley. Too bad the radio won't work."

"One thing I'm afraid of," the doctor said slowly. "The cosmic ray is increasing in power. My death beams can't battle it much longer. Indeed, it's seeping through already. Look at that!"

He pointed to a small, rounded stone about as large as his fist which was on the ground near by. Without visible means of propulsion, it was moving slowly toward another stone several feet away. Burford, the promoter, stared with bulging eyes.

"Ye gods," he murmured hoarsely. "Now I'm crazy too!"

Chuckling, Marden moved forward and picked up the stone. It seemed, oddly, to writhe and move beneath his fingers. He dropped it.

It bounced. A solid bit of rock—bounced! On hard ground, it bounded up several feet, and as Marden gasped in amazement, it went, in a series of little leaps, toward the other stone. It hit it with a little cracking sound, and apparently stuck to it. The grey surfaces of the stones seemed to crawl. Abruptly there was only one rock, twice the size of either of the two original ones.

"Life," said Kent. "Atomic life. Growth—and adaptation."

The ground shuddered beneath their feet. The joists of the house cracked ominously. "Maybe we'd better stay out here," Harrison suggested, a frightened note in his voice.

"I'm going in to watch the screen," said Dr. Kent. "We'll be able to see the sphere on it when it becomes visible in the super-universe."

Burford's thick lips were moving soundlessly. Marden didn't like the glassy stare of his pale eyes. Frightened, superstitious, there was no telling what the squat promoter might do. He determined to watch Burford closely.

Nearly an hour had passed. Little had happened. It had become a common sight to see stones crawling slowly along the ground, in curious, ameboid movement. Too, the ground itself seemed oddly unstable, prone to shaking and giving dangerously beneath one's feet. The house, in the very center of the invisible barrier of death rays, was little affected as yet. Once a chandelier had dropped to shatter on the floor. Occasionally a window would smash for no visible

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reason.

Marden alternated between his uncle's laboratory, where Dr. Kent sat with his eyes glued on the screen showing the super-world, and outside the house, where the others wandered about in a somewhat dazed fashion. He watched Burford covertly. It was clear that the man was cracking under the strain.

His lips moved continually, and frequently Marden would catch such phrases as: ". . . Judgment day . . . all goin' to die . . . end of the world . . ." And once the man had turned to shout at him, "We'll all be dead pretty soon. We gotta make the most of life now!"

Marden had moved forward to quiet him, but the promoter had become silent abruptly as Lorna came into view around the corner of the house.

"Okay," he said to Marden's sharp remonstrance. "Forget it, buddy. I'll be all right."

MARDEN wasn't so sure. Nor was he surprised when, a few minutes later, while standing beside his uncle watching the screen, he heard an angry shout from outside the house. Swiftly he was on his feet, racing for the door.

Lorna was struggling in the grip of Burford, trying to evade the kisses he was planting on her averted face. Harrison, the college boy, was sitting nearby staring around dazedly. A blue welt was rising on his chin.

"Stop it, Burford!" Marden snapped. The promoter's head jerked back, and quickly he released the girl. She leaped away, pausing in the doorway of the house as Marden lunged forward. He had seen Burford's hand dive beneath his coat, and he guessed what that meant.

He was right. Burford's hand came out with a gun. But he didn't squeeze the trigger. He lashed out viciously at Marden, brought the barrel crashing against the man's head. The world went black.

Dimly Marden heard a scream. He got to his feet, fighting back his dizziness, just in time to see Harrison stagger into the house. The others had vanished.

Marden got to his feet and followed Harrison. From the laboratory came a cry, and the crashing of glass and metal. In the doorway Marden stopped, swaying.

Burford was backed against a wall, his gun menacing the three figures who stood facing him—Lorna, Harrison, and Dr. Kent. A tangle of wreckage on the floor beside an overturned table betrayed the struggle that had taken place.

"You fool!" Kent shouted. "That's the ray projector—the death ray—and you've wrecked it! We're unprotected now!"

"Shut up!" Burford snarled. "I'm gonna live the last few minutes of my life." He waved his gun at them.

Suddenly the floor shuddered. Joists creaked ominously overhead. Somewhere a pane of glass shattered.

Marden sent his body hurtling forward. Burford had not yet seen him, and there was a chance—

The gun roared. A bullet screamed by Marden's head, buried itself in the wall. There was an unnaturally loud rending of wood. Marden hit Burford's legs, sent him hurtling back.

According to all natural laws, the promoter's gross body should have smashed against the wall with an impact that would have driven the breath from his body. But the wall wasn't there! Marden had a flashing glimpse of wallpaper stretching and ripping, of a gap appearing in the solid wall as Burford's body was flung back; and then the two lay, dazed and incredulous, on the floor—half in one room, half in another. There was a four foot gap in the wall reaching from floor to ceiling.

Faintly he heard Dr. Kent's triumphant cry.

"The sphere! It's there—it's Outside!"

He knew that the tiny, glistening globe bearing the deadly thernolyn had at last become visible on the screen, had at last reached the super-universe. Whether it would explode or not—

THE fate of a Universe hung on that question. But at the moment Marden was concerned with a

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more immediate problem. Burford, half pinned beneath his opponent's body, had wrenched his arm free, had swung it up until the gun pointed at Marden's face. The muzzle seemed to be growing larger and larger as the promoter's finger tightened on the trigger.

A look of astonished horror came over Burford's face. He was staring, not at Marden, but at the revolver in his hand. So was Marden. It was no longer a gun.

It was alive!

The barrel twisted like a snake. It seemed to grow shorter. It was a blob of shapeless, bluish metal in Burford's thick hand. The man screamed in agony.

His fingers were caught in the writhing metal as it contracted. Blood spurted out suddenly, splashing Marden's face. He didn't move, even though he heard a crashing of falling timbers. The floor twisted and swayed beneath him. He felt himself flung up as though on the crest of a wave—up and up, until his head struck something with a sickening crack. He knew it was the ceiling.

He heard Lorna scream, heard Kent and Harrison shouting. Somewhere metal crashed. The world had gone insane.

All over Earth, in that incredible moment, fantastic scenes were being enacted. For twenty-four hours inexplicable things had been happening. No one could explain them. Newspapers had carried flaming scareheads until the presses had refused to operate. But not until the last moment had the cosmic ray sent its full power roaring through the Universe, the stupendous power of unchained life that had sent a nebula thundering from its course. In that tremendous second when the earth lived men went mad and death stalked unbridled.

Prometheus unbound! The power of life was no longer limited to organic matter, and the cosmic ray ruled over an Earth gone mad!

A truck driver jammed on his brakes as the ground swayed beneath him, and stared with bulging eyes at the Los Angeles City Hall, towering in white majesty. The Southern California city's only skyscraper was moving! It was gliding out into the street, crushing buildings in its path, hurtling relentlessly toward the man in the truck. He jumped out of the vehicle and started to run. There was a grinding, thunderous roar, and he threw a terrified glance over his shoulder at an eidolon of smooth white blankness that was almost upon him.

The building seemed to be melting down to shapelessness—its outlines were blurring, the corners rounding, the tower becoming a mere blob. He screamed as he was engulfed, and then a thing like a puddle of animate stone was smashing its way along Broadway.

In a New England cemetery the watchman was having a quiet smoke as he leaned against a tombstone, pondering over the curious events of the preceding hours. He felt an uneasy stir beneath his feet and got up quickly. He hoped it wasn't an earthquake.

It wasn't. Out of a crack in the grass-covered earth something was seeping up—something which the watchman knew very well he had seen buried there three weeks before. It looked almost human for a moment, and then became a horrific mass of monstrous flesh and bone that seethed and bubbled as it crept toward him. The watchman was frozen with horror. He thought it was merely a dead man coming to life.

HE didn't know that it was the atoms in the dead body which had come to life. There was no intelligence—the original organic vitality had fled forever. This was something different. Adaptation and—growth.

The thing touched his feet, flowed up around his legs. He felt a sharp pain biting through his body as his flesh coalesced with the horror—which was merely following its natural instinct of feeding so that it might grow, just as the two rocks had merged in Dr. Kent's garden. The watchman stared silently at the tide of horror creeping up his body, and little flecks of foam appeared on his lips.

And adaptation. In the Pacific

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Ocean, the crater of Mauna Loa had become unusually active. Natives eyed the mountain with apprehension, whispering of the Old Woman who is supposed to dwell beneath the volcano and breathe out flame when she is angry with her worshippers. An aviator, flying low over the crater, battled to hold his plane steady while his co-pilot watched with incredulous eyes.

The crater appeared to be widening.

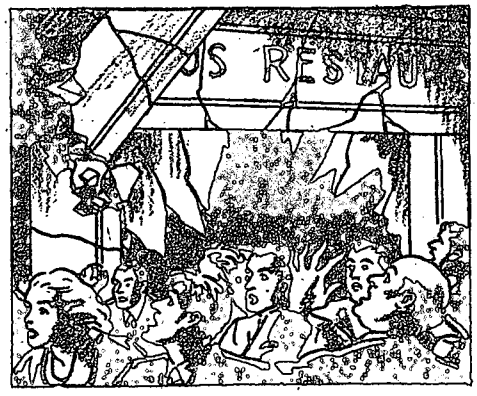
Actually, the mountain was spreading out. The intense heat of the molten lava had caused the atoms of the mountain some obscure discomfort, and it was simply going away to a cooler place. The peak seemed to roll away on all sides, like a flood of lava descending. But it wasn't lava. It was Mauna Loa, spreading out in a great circle, wiping out all life, and coming to rest at last under the ocean that surrounded the island. The tremendous air-currents tore the wings from the plane, and it dropped like a plummet to destruction.

In the Adelphi Theatre, in London, a dancer was pirouetting about the stage, wearing a skimpy but adequate garment of steel-mesh. She came to a halt in the center of the stage, with the spotlight focused upon her, striking a climactic pose. Abruptly the mesh cloth which was her sole garment seemed to crawl over her body, and dropped to a tiny puddle of glistening silver at her feet. The audience applauded wildly, heedless of the shrieks of a fat matron in the dress circle whose several dozen diamonds had suddenly decided to unite.

They raced over her plump bosom, sending her into hysterics, and, fusing in her lap, turned into carbon—ordinary coal. A quite natural phenomenon, under the circumstances, but one which caused the matron to drop dead of heart failure.

A European dictator, reviewing his army, was extremely pleased with a new type of war tank, capable, as one of his generals explained, of killing forty times as many men as the tanks used in the World War. While examining the interior of the tank, the dictator cracked a joke, at which his general laughed dutifully.

Some obscure vibration in the man's bellowing laugh had an important effect upon the metallic atoms surrounding them. Soldiers standing at attention outside were treated to the spec-



tacle of the slow collapse of the tank, while the men imprisoned within it screamed vainly for aid.

Neither the dictator nor the general survived.

In Sing Sing prison, a man, waiting to be hanged, was pleased to discover that the bars which held him prisoner were melting into a wholly inadequate little fence on the threshold. However, as he was about to leave, he inadvertently stumbled against the stone wall of his cell, and a hole appeared in the concrete large enough to permit easy egress.

At this he decided he was dreaming, and therefore remained where he was.

IN a little valley in the California mountains Jim Marden was pinned between the ceiling and a floor that had risen like a wave, listening to his uncle's exultant shout:

"I've done it! By the Lord Harry, I've done it! The sphere's exploded!"

Marden will always regret that he did not see the screen at that last climactic moment. There was really little to see, Dr. Kent told him later. The tiny, shining ball had suddenly appeared on the screen in the midst of the other-world microscope, and as suddenly the screen had flared up in a blaze of white light—and had gone blank.

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The explosion had undoubtedly wrecked the Outside microscope, if not the entire alien laboratory, and simultaneously the cosmic ray had ceased to function.

Marden managed to extricate himself, and clamber down a steep slope that had once been part of the floor. Burford, they found, was dead. He had been crushed between ceiling and floor, a fate which Marden himself had escaped by the narrowest of margins. Neither Harrison nor Lorna was seriously injured.

They were glad to get out of the wrecked house, and for a little while stood silent in the dusk, staring around at a world that seemed, oddly, little changed. After a time Kent said, "There'll be reconstruction. Man has survived, undoubtedly. And he'll rebuild. In fifty years—twenty-five—there'll be no trace of this catastrophe."

"There'll be no—recurrence?" Harrison asked weakly. The doctor shook his head.

"According to our time-sense, it'll be thousands of years, maybe millions, before those Outside can replace their apparatus. A day or a week to them—and an age to us. Even so, how can they find an atom? No, the Universe is safe now—forever, I think."

"The cosmic ray is gone?" Marden inquired. "We're still alive, though."

"Of course. The ray only *creates* life. After it is created, it can exist independently. Luckily, the life of the atoms was transient. There was not sufficient time for them to reach a point where they could continue their life after the cosmic ray had been destroyed. It's the same old Earth, Jim."

Marden didn't answer. Kent looked up.

His nephew was very close to Lorna, and she was smiling up at him. Harrison said something inaudible, and then glanced at the doctor, shrugging resignedly.

Dr. Kent grinned.

"Yes," he observed with relish. "It's the same old world!"

SCIENTIBOOK REVIEW

MARCONI: THE MAN AND HIS WIRELESS. By Orrin E. Dunlap, Jr. Illustrated. The Macmillan Company. $3.50.

IN 1901 Signor Guglielmo Marconi sent the first wireless signal across the Atlantic from Poldhu in Cornwall to St. Johns, Newfoundland. It cost Marconi $200,000 to send those three dots across the ether—but it was worth it.

Marconi and wireless are inseparable and synonymous. One cannot be told without the other. Marconi's life is a chapter in the history of civilization. What he has achieved—what he has said—all interwoven with his inspiring personality and the genius of his soul, make an impressive, almost incredible story of accomplishment within the span of a lifetime.

In less than forty years Marconi saw wireless communication develop from the slow spelling-out of telegraphic signals between two points in the same house to the world-wide transmission of music and the human voice; within thirty years from the time when he succeeded in hurling the letter S across the Atlantic it was possible for the whole world to chat back and forth through the air, across oceans.

Out of Marconi wireless and the vacuum tubes developed by such men as Langmuir, Willis R. Whitney and W. D. Coolidge came the familiar radio—something civilization could not do without. The monument of the man who did so much to make this possible will stand in imperishable bronze, and Mr. Dunlap has done well in giving us his story so authoritatively and interestingly.

Marconi's scientific interest began when he was a boy on his father's estate near Bologna. Of delicate health, he read widely in the older Marconi's scientific library, tried to extract nitrogen from the atmosphere and amazed his parents by his passion for anything pertaining to electricity. In 1894, when he was 20 years old, he read how Hertz "radiated electromagnetic waves with an electric oscillator he had developed, and how little sparks appeared in the tiny gap of a metal loop across the room, although there was no connecting link except the air." At once it seemed to him "that if the radiation could be increased, developed and controlled it would be possible to signal across space for considerable distances." His "chief trouble was that the idea was so elementary, so simple in logic, that it seemed difficult to believe no one else had thought of putting it into practice."

For the layman the story of Marconi as presented here is an exciting drama of one of science's most significant milestones.—R.L.D.

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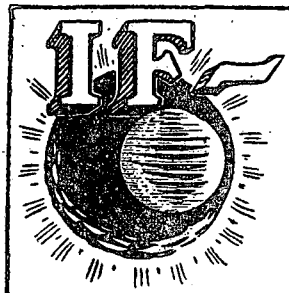
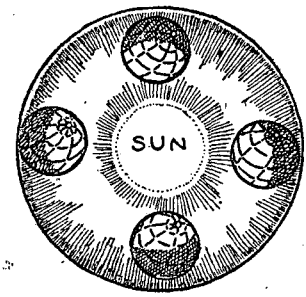
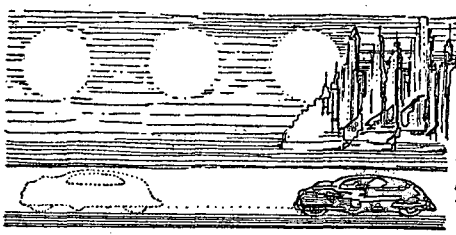


THE EARTH STOPPED ROTATING! GRADUALLY OVER A PERIOD OF YEARS.

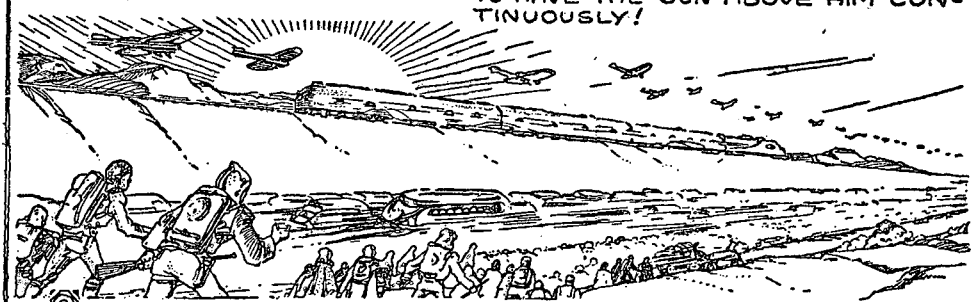
BY JACK BINDER



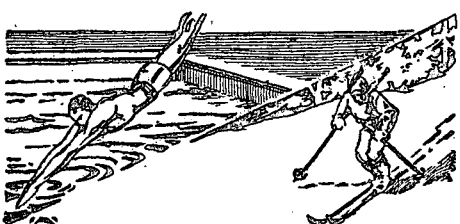
THE FOUR REGULAR SEASONS WOULD CEASE TO EXIST. INSTEAD, THERE WOULD BE A SIX MONTHS' DAY AND A SIX MONTHS' NIGHT SUCCEEDING EACH OTHER. BLAZING HEAT AND INTENSE LIGHT FOR HALF A YEAR—BITTER COLD AND DARKNESS FOR THE OTHER HALF!



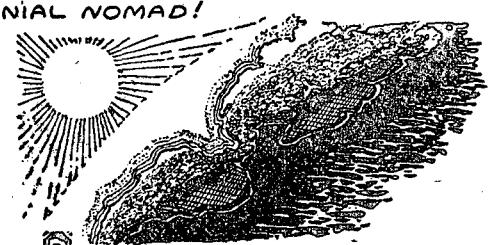
THE SUN, AT ANY ONE SPOT, WOULD RISE WITH EXAGGERATED SLOWNESS. SUNRISE WOULD BE A PHENOMENON OF TWO WEEKS. WESTWARD TRAVEL AT THE RATE OF SIXTY MILES PER DAY IN NEW YORK'S LATITUDE WOULD PERMIT A TRAVELER TO HAVE THE SUN ABOVE HIM CONTINUOUSLY!



ONLY EARTH'S EQUATORIAL BELT WOULD BE HABITABLE DURING THE LONG NIGHT, ALTHOUGH INTOLERABLY HOT DURING THE DAY SEASON. THE *TEMPERATE* ZONES WOULD BE COMFORTABLE IN THE REVERSE PERIODS. THUS THERE WOULD BE AN EQUATORIAL MIGRATION AT "SUNSET" AND A NORTH AND SOUTH EXODUS AT "DAWN". MANKIND WOULD BECOME A SEMI-PERENNIAL *NOMAD!*



PERMANENT CITIES WOULD HAVE TO BE EQUIPPED WITH ELABORATE REFRIGERATION PROTECTION FOR THE LONG, HOT SEASON, AND WITH SUPER-HEATING EQUIPMENT TO GUARD AGAINST THE LONG MONTHS OF FRIGID NIGHT. FOOD WOULD HAVE TO BE STORED IN TREMENDOUS QUANTITIES OR CREATED SYNTHETICALLY!



PLANT-LIFE WOULD FOLLOW THE SUN AROUND THE EARTH, GROWING PROLIFICALLY IN A WIDE BELT STRETCHING FROM NORTH TO SOUTH, CREEPING OVER EARTH'S SURFACE TO BLOSSOM IN PERPETUAL MORNING SUNLIGHT. ANIMAL LIFE WOULD FOLLOW THAT BELT. MANKIND WOULD MIGRATE ONLY IN THAT ZONE!

Next Issue: **IF A SECOND DELUGE FLOODED THE EARTH!**

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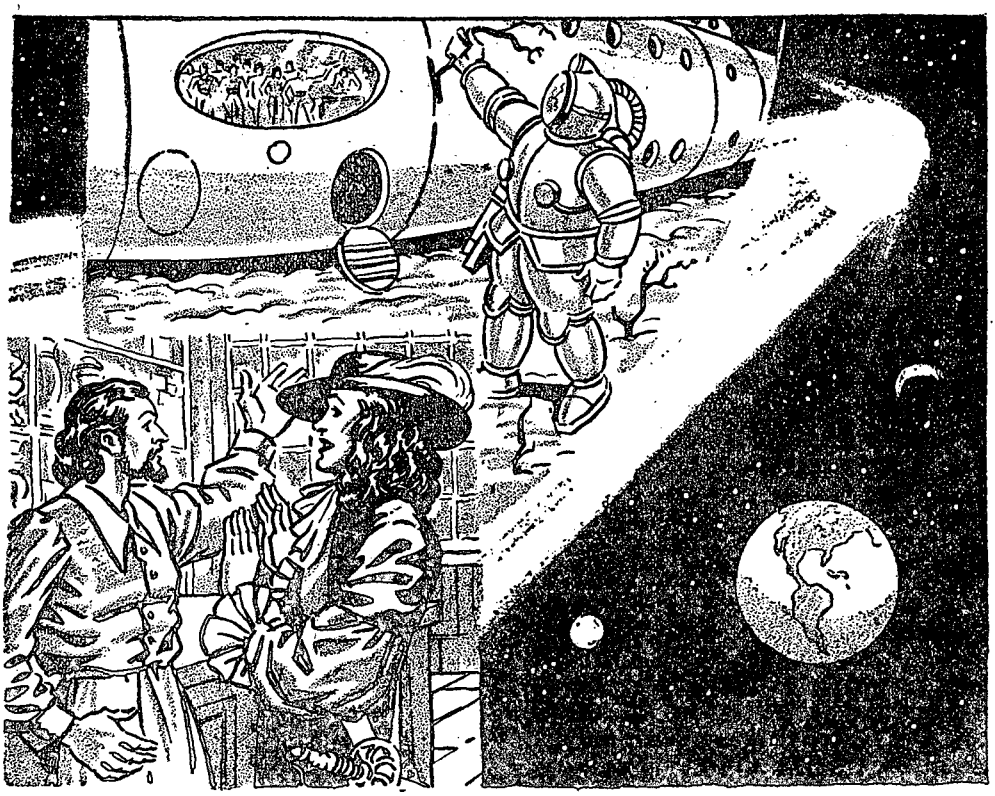

A COMET PASSES

For Scores of Centuries Mankind Ponders the Wonder of the Heavens as Celestial Fire Careens in Its Orbit in the Skies!

By EANDO BINDER

Author of "Judgment Sun," "The Chessboard of Mars," etc.

Prologue

"NOW each of you," said Professor Higgins, "can take a look through the telescope and see just how flimsy and tenuous the comet's tail really is."

It was 1910. Halley's comet, the most conspicuous and dependable of all the comets, hung in the night skies resembling a giant rocket ship speeding through space, exhaust gases jetting steadily and furiously.

Professor Higgins' small telescope, regulated to follow the comet in its course among the stars, magnified the tail so greatly that through its wraith-like veil could be seen clearly the celestial suns. His dozen guests of the evening peered into the eyepiece one by one and found no words to describe the majestic beauty revealed to them.

"A comet," Professor Higgins addressed the group, "consists of a tiny nucleus, probably solid, various envel-

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opes of tenuous gases that distend it to giant size, and a long stream of ejected gas so rare and sensitive that even the pressure of the sun's light is able to push it around, so that while the comet swings around the sun like a stone on a sling, the tail always points *away* from the sun.

"Now, just what is the tail, why does it stream from the nucleus, and why does it shine so brightly? As I've mentioned before, astronomers know little about comets, and the why and wherefore of the tail is still a mystery to scientists. Of course, the spectroscope has told us that the tail gases contain cyanogen, carbon monoxide, and nitrogen, but their peculiar brilliance and their emission from the nucleus is a subject for controversy. The study of that class of phenomena takes the astronomer into the most intricate theories of higher physics and chemistry, and the tale of the tail—if you will pardon a pun—is not yet fully told.

"Let me say this, though, about those bodies which occasionally flare up in our night skies to the astonishment and wonder of all mankind, adding to the magnificence and thrilling mystery of the Universe. We can only

surmise, my friends, what great influences comets may have had on past history when they appeared blazingly in the ancient skies, causing uneducated minds and superstitious hearts to quake and tremble.

"Many comets in pre-scientific recordings have been coupled with plagues, earthquakes, wars, and the rise and fall of empires. It would be fascinating indeed to have a supernatural power enabling one to visit the past during each of the comet's appearances and to see just what effect they had on credulous people who believed in nether spirits, demons, and all sorts of strange gods." . . . .

CHAPTER I

Fear

"CLUB-KILLER," a squat and powerful figure, moved warily through the fringes of jungle. Swung over his brawny shoulder, but poised for instant use, was a short, heavy club of very hard wood. Its end was bulging and knotted. There were strands of animal hair and spots of dried blood ground permanently into the grain. Many and many a time had that crude but effective weapon sped the lives of other jungle creatures.

Club-Killer neared the spa with extreme caution, choosing a rocky route. Saber-Tooth, whom he was hunting, did not like rocky paths. Therefore he would not catch Club-Killer's spoor. Nearing the spa, Club-Killer lifted himself into a huge tree.

One by one the forest beasts, timid and wary, slunk up like wraiths and drank from the spring below. Sometimes two and three at a time. Club-Killer was not aware of Saber-Tooth's tawny presence until the animal catapulted out of the bushes like a lightning bolt.

Two hoofed creatures fell easy prey. Saber-Tooth, half bear and half tiger, had killed one by ripping off its head with a mighty paw, and the other with a snap of its great jaws.

Club-Killer trembled. Now was his chance. He dropped in the shadow of the tree, balanced himself on his toes, and ran forward. The mighty club upraised in both hands, Club-Killer swung it down at the tawny skull slobbering in fresh meat and hot blood. All the force of his great shoulders and the momentum of his run was in that blow. Saber-Tooth tumbled to the ground, his skull crushed like an eggshell.

Panting, Club-Killer gazed down at the great animal he had killed. Then he expanded his mighty chest. From his lips rolled an ululation that bid defiance to all the world.

He had killed Saber-Tooth. He was great and mighty. He could hunt now without fear. Who would dare to

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stand before the killer of Saber-Tooth? He was lord of the jungle again. Of slinking panthers, cowardly hyenas, and such he had no fear. His knotted club was more than they could match. He stepped away from the spa and made his way out of the jungle. Unconsciously, he swaggered.

Suddenly he stopped stock still, staring into the heavens. A most awesome thing was there—a flaming ribbon of light that stretched from horizon to zenith. One end was a ball, the other flared fanwise. It hung in the pool of stars like a roseate saber.

Club-Killer faced the light for a brave moment. Then a howl of abysmal fear tore from his lips. Dropping his club, trembling in every fiber of his being, Club-Killer the mighty, slayer of Saber-Tooth, ran precipitately back to his cave. He sneaked into a corner, trembling with fear, terrified by the awesome spectacle of fire in the heavens.

SURROUNDED by Oriental splendor the young man with curly brown locks of hair looked moodily at the dozen men eating and drinking with the great gusto of military life. The young man alone of the assemblage was smooth shaven, and that, together with his fair skin and handsome, boyish features, made him look younger than his thirty years of age. Yet his exotic clothing was the richest of the lot, and despite his youthful appearance the men seated before him treated him only with great deference and respect.

They were officers of the Greek army and their leader, the youth at the head of the table, was Alexander of Macedonia, later to be known as Alexander the Great.

Alexander sat there, hardly tasting of the rich and spicy foods of Persia's fertile tillage, staring moodily at empty air. A great problem weighed on his mind. He turned suddenly to General Polemus, who sat at his right.

"Polemus," he spoke at last, in a voice of commanding timbre, "shall we go on? Shall we add to the glory and greatness of Greece?"

Polemus answered cautiously: "There is none more eager than I to add to the greatness of Greece. Yet let us remember those wise words: 'They that lust for too much, sometimes lose all.'"

"In other words," said Alexander, fixing his general with a compelling eye, "you intimate that if I seek new conquests, I may have dissolution of the empire at my back?"

"Yes, Emperor," said Polemus firmly, despite scornful glances from some of the others. "I have hinted it before, but now I will state it openly as my opinion of what would be the outcome if we ventured past the Indus, which at this moment lies outside, ready to be crossed."

The company held its breath, expecting Alexander to denounce Polemus in arrogant wrath, for Alexander, vain and conceited, disliked being balked or advised. But the young world-conqueror surprised them all, Polemus included, by merely raising his eyebrows. Then he turned to General Kalijan at his left.

"And what say you to that, my fiery Kalijan?"

"I say piffle," spoke Kalijan with a leer toward Polemus. Kalijan, a Persian formerly in Darius' great army, and who had been elevated to officership in the Greek army because of his reputed military genius, was truly a son of Mars. "Beyond the Indus River which lies at our feet is a great and rich land in which there are shrines of gold, solid gold, by Zeus! Even before you, Emperor, came along to show us how to fight, my people used to cross over and in small raids carry off priceless booty. I tell you there is treasure for the taking in that land of Dravidians, and the people—*poof!* We could blow them away like chaff. May all the gods eat my heart out if I am wrong!"

"Good!" applauded Alexander as the roar of Kalijan's voice died away. "Now here we have the sagacious Polemus on my right hand—the faithful general who has been my constant shadow for a decade—bidding us turn back lest my empire fall apart, and we have the stormy Kalijan at my left shouting that great wealth is ours if we cross the river. Now my captains and majors, what thinks each of you?"

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DOWN the line went Alexander, addressing each one in turn, asking which way their inclinations went. The final count showed five that agreed with Polemus, and five that voiced most heartily agreement with Kalijan. The rest would give no committance, and said that wherever their Emperor led them, they would follow, whether ahead or back.

Alexander sighed, glancing from left to right perplexedly.

"So it stands, six to six! Either I must cast my decision or—Ah, me! If only the wise Aristotle were here!"

Alexander seemed to fall into a trance, and the officers took the opportunity to gorge themselves with more food and wine. Alexander's hesitancy at this time, when formerly his decisions had always been instantaneous, was a most strange thing to his officers. Having conquered practically the whole Western part of the then-known world, what secret doubt caused him to pause at the brink of the Dravidian lands (India), well knowing it was rich and unprotected?

No one knows. . . .

But Alexander did cross the Indus, apparently having made up his mind to conquer India. A week later his army had marched south on the other side of the Indus to a point from which to strike out in the conquest of that vast land. It was night and the young conqueror sat alone in his tent, again moody and thoughtful. Despite his high resolve, and despite Kalijan's blustering confidence, Alexander vacillated. On the morrow he was to give the signal to advance into the new land.

Should he listen perhaps to staid and earnest old Polemus and turn back? If he entered India and lost himself in its conquering for a few years, might he not return to the West to find himself a throneless monarch?

Suddenly there was a low murmur from outside and a moment later an orderly dashed into the tent, gasping in excitement.

"What is it, fool? Speak and tell me!" said Alexander, springing to his feet, thinking that some mysterious enemy had attacked.

"Emperor! There is a strange light in the sky. No one knows what it is! The men are uneasy and—"

Alexander brushed the orderly aside and darted outside the tent to step out under the stars. Almost at the same moment the officers came running up.

They all peered at the celestial phenomenon that hung eerily over the land of the Dravidians like a giant glow-worm with hairs of light spreading in a grand sweep toward the nadir. There was no moon, and in the blackness of night it seemed to pulsate and writhe, as though it were angry.

"It is a fire in the sky," said Kalijan, breaking the silence of the company. "By Zeus, I hope it does not fall here!"

Polemus had been watching Alexander's face closely, and had seen written there a great and fearsome awe. Alexander had always been known to have great respect for soothsaying, black magic and the like.

"It hangs over the land of the Dravidians," Polemus suggested craftily. "Might it not be their god preparing to protect the country against our invasion, with a bolt of lightning in his hand?"

Alexander started nervously and peered yet more closely at the heavenly light as though to verify Polemus' subtle surmise.

"Yes—yes," the world-conqueror said softly, too stricken with awe to raise his voice. "Tomorrow we start back for Greece!". . . .

CHAPTER II

Prophecy

THE astrologer held the paper close to the flickering taper and read from it—or appeared to read from it.

"Jupiter being in the ascension and fast approaching opposition to Mars, which presages much battling; and Saturn retreating from the zenith and waxing to brightness in the early morning hours, it is apparent that the zodiacal signs are tending toward a three-fold triangular configuration,

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which—"

"The devil take you!" burst in Count Robert testily. "Do you play with my temper? Have done with your learned embellishments and give me the gist of the matter, or by God, I will—"

"You will read it yourself?" mocked the astrologer, holding out the parchment.

"Oh, no, no," said D'Aine hastily, to whom writing was as much a mystery as star-gazing. "My—my eyes are bad; I would but fumble it. You read, good sir, but for Mary's blessed sake, tell me what I want to know!"

"Then listen closely," said the old man, making his voice sonorous and portentous. "I have read the stars. I have bared their celestial secrets. It has been revealed that your invasion into barbaric Saxony, sometimes called England, will prosper greatly providing it be done instantly. You will win much, Count Robert, and your name will ring in all Normandy as one of its most heroic leaders."

The astrologer, without raising his head, rolled his eyes to see what effect the words had had on his patron. Count Robert's face had suffused with a radiant glow and his eyes shone happily.

Satisfied, the astrologer continued reading in the same sepulchral, prophetic voice: "The Saxons will fall before your men-at-arms like reeds, wondering frantically what invincible enemy has attacked them. But you must push ahead rapidly or your conquest will go for nothing. Fear not, for the stars have crowned your future with glory."

"*Voila!*" cried the count as the old man stopped. "Success—fame—glory—they shall be mine! If the stars say it, how can I fail?"

"As the stars foretell, so shall it be," nodded the astrologer. "Soothsaying, the mortal gift divine, as read in the almighty stars, is a true portent of the future. Your ten pieces of gold will bear you an hundred-fold fruit, in that my predictions send you on your conquest the sooner, that it may be wholly successful."

The count spoke after a pause: "You will remember to what death a certain self-named astrologer came at the hands of the wrathful Duke de Chaplette—how he was hunted from his hovel and tortured, and forced to eat his own lying tongue! Remember that, old sir, and remember that I am like to do the same thing to you if my future is not as you paint it!"

Despite a chill that clutched his heart at the threat, the old astrologer answered firmly: "You threaten one who has no reason to fear your words, in that he knows he has read the stars right. However—"

He licked dry lips. "However, come with me to the roof. I will check once more my calculations." He did not think it necessary to mention that he might find a disturbing note in the stars, so that he might make his predictions double-edged.

FALTERINGLY the astrologer led the way up rickety steps with a candle to light the way, and ushered his guest out into the chill of midnight on the flat roof of his ancient abode. Hardly had they stepped out under the open sky than they both gasped aloud.

Hanging in the void and slowly ascending from the horizon was a celestial phenomenon unmatched for grandeur except perhaps by an eclipse of the sun. Its dazzling brilliance lighted up the desolate moorland almost as the moon might have at full, and the long, shimmering tail which streamed from a head many times brighter than scintillant Venus seemed to be unwinding from some cosmic spool below the earth.

"Blessed saints!" cried the count, crossing himself. "What—what fearsome thing is that?"

He suddenly grasped the astrologer fiercely by the arm.

"You that have watched the heavens three score years and more, and have read the meanings of its eternal pageant—*you* must know what it means! Tell me, what does it signify in my horoscope?"

It was a poor time to falter, and realizing it, the old astrologer spoke firmly, increasing his voice till it became a cackling shout.

"It is a godly symbol, a heavenly

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talisman," he intoned, "and he that acts to his best ability and to the most righteous purpose while its influence reigns in the skies will surely become great and mighty. More than that I cannot and will not say."

"Then if I begin my campaign this very night—this very night of May 10, 1066," said the Norman eagerly, "I will be attended by the great fortune that this mysterious light from heaven sheds on mortals below! Is it so, old man?"

"It is so," nodded the astrologer.

Without a further word the count sprang away, raced down the steps, flung himself on his horse tethered outside the door, and galloped away toward the Norman military headquarters.

The astrologer watched the horse vanish in the night gloom. Then he suddenly became imbued with an energy, if not quite as spry, at least as earnest as that displayed by the count. He stumbled down the steps, nearly breaking his thin neck in the process, and flew into his room of books and writings, shouting a name at the same time until the whole building rang with echoes.

"Jebedee! Jebedee! Come here at once! Jebedee-e-e! Thou sluggard! Thou cursed snail! Jebe—"

"Yes, master," answered a voice at the door. Jebedee, the old man's apprentice and future successor as astrologer and alchemist, stood there but half dressed.

"'Tis about time," growled the old man, thumbing a book furiously. "Can you come no quicker when your master calls and when every second is precious beyond sight?"

"I was in bed, master, as is my rightful due. I came as quickly as I could—"

"Cease thy aimless chatter, fool, and harken to me. Jebedee, this night may see the accomplishment of my life-long aim—in fact, the dearest aim of every one of our learned sect."

Jebedee gasped and blinked.

"What do you mean, master? Not—not—" his voice fell to a hushed whisper—"not the philosopher's stone!"

"Exactly," cried the old astrologer. "If I could only find—ah, here it is. Zolon's masterful treatise—"

HE HELD a volume up to the light, retrieved from the midst of the pile, a most aged and battered sheaf of crudely bound parchment which would be ready to crumble to dust in another few years. Yet in spite of its poor condition, the black-inked writing on its pages was clearly legible wherever the page itself was not missing. The astrologer fumbled through the sheaf excitedly and finally stopped at a sheet marked with superimposed notes on the margin.

"Yes, yes, Jebedee, my son," said the old man. "The Philosopher's Stone itself! Listen, I will translate a passage from this vile Greek, written before our lifetime by Zolon, the master magician of Zoroastria! As follows:

. . . and this compound, treated with human blood, and then exposed to the magic rays of a strange spear of light, that has a nose and tail and which comes but once in a millennium, will cast out of itself a stone like unto a ruby, but with magical powers that change base metals to pure, shining gold! I swear in the name of dread Baal that I had the stone three days and made with it a huge sack of golden metal, and then I was preyed upon by thieves who took both gold and stone. . . .

"Did you hear, Jebedee? The strange spear of light that has a nose and tail and comes but once in a millennium is in the sky at this moment! Hurry, prepare me the first part of this compound, while I do the rest. Hurry, Jebedee, it will be our one and only chance to achieve this great thing—a magical stone which can change dross to gold!"

An hour later, after the laboratory had been filled with the reek and fumes of corrosive chemicals and boiling liquids, the two zealous alchemists stormed to the roof with a bronze pot of hissing and seething chemicals, into which they both poured some of the blood of their veins from self-inflicted wounds.

Then they stepped back to let the magical glow of the strange heavenly object pour into the pot, to crystallize in its fuming depths the Stone that would convert lead to gold. At least, so they hoped!

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CHAPTER III

Reason

"ONE of your bronze crucifixes with a chain for the neck," requested the woman who had just entered the small jeweler's shop. She continued as the shopkeeper selected one from stock and proceeded to wrap it carefully: "And can you guess, *M.* Brignaic, whom it's for? None other than Briggs, that worthless English drunkard whom I have kept out of the gutters these last two months!"

Madame Brignaic jerked her head from the floor, where she had been picking up the broken pieces of a set of dishes her husband had knocked down.

"What does *he* want with a crucifix, God bless us, he that came in this shop once and cursed most bitterly our church?"

"Would you believe it," informed the customer, "that he is mending his evil ways? And of course there is but one thing that has brought such a lost soul to repentance—"

The woman pointed aloft significantly, paid for her purchase, and hurried out. The Brignaics looked at each other in astonishment.

"And it is also *that* which caused me to break the dishes," said M. Brignaic solemnly, pointing upward, as his customer departed. "I tell you, wife"—his voice became shrill—"it is like to drive me mad! Each day for a week now it has been the same. Every hour, every minute, every person that comes in talks of it in hushed tones, in awed tones, in frightened tones. Even Captain Jussic, who fears nothing, came in this morning subdued and quiet. And the news of the day, what does it tell—riots, bloodshed, insanity, murders.

"The past week has seen more of such horrible things than any full year before. Only this morning, while you were asleep, a man ran screaming by in the street, perfectly mad, waving his arms and pointing in the sky. And do you know, Maria"—his voice fell low suddenly—"it can now be seen in broad daylight!"

The woman crossed herself, gasping, her previous rage over the broken dishware completely forgotten.

The comet of 1680, very bright and dreadfully large, seemed to hang over the world ominously, threateningly. Its effect on a civilization that had barely struggled from the abysmal superstition and ignorance of the Dark Ages was profound, striking terror into the hearts of the masses. Weak, depraved and timid natures, unable to quell a rising fear, broke at the weakest link of their mental chain and metamorphosed into l u n a t i c s, beasts, and cringing human rats.

In the larger cities like Paris, mobs would tremble and shudder and suddenly run amuck, killing and destroying in the blind fear that had come upon them. Even strong minds could not gaze upon the awesome celestial light without qualms of doubt and wonder. Of course, there were ten thousand different opinions concerning the phenomenon. One claimed that it meant the coming of the Second Christ, another that it predicted Earth's destruction by fire.

But there were at that same time a few, a pitiful few, who in the light of a new science, were neither frightened nor amazed.

IT WAS the evening of the day that M. Brignaic had broken the chinaware in extreme nervousness. With the approach of dusk and the thought of that awful light in the sky, the shopkeeper became more and more nervous. He had heard practically all of the dire predictions circulated among the masses and in his simplicity believed the worst of them—particularly those that promised destruction and damnation.

He moved about his shop warily, as though ready at any moment to flee should something happen. His wife was in the rear with the children, comforting them and refusing to let them out of her sight for even a second.

Quite suddenly the street door swung open and two figures rushed in. One of them promptly threw his arms around M. Brignaic's neck.

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"Father, it is I—Enric, your son!"

Recognizing him, the old man burst into happy tears.

"My son!" he sobbed. "Is it truly you? It has been such a long time—"

The young man cut him short: "Explanations later, Father. Right now I want you to serve this gentleman whom I've brought here—"

The other man, considerably older and very impatient at the moment, immediately spoke: "A block of Naples paper, my good man. And hurry. Naples it must be; I use no other. Holds the ink well. No, don't wrap it—I must be going immediately. The night will be over only too soon, and I have much to do."

With the paper clutched tightly under his arm, he ran to the door, speaking over his shoulder: "I will expect you in an hour, Enric."

"Who was that?" asked the shopkeeper, astounded, as a carriage rumbled away from the door.

"My master, for whom I work," informed Enric. "He took me for his assistant when I met him at Oxford. Father, that man will one day be famous, if not while alive, at least after death. His name is Dr. Halley. He is an English astronomer and mathematician. I have but an hour to stay with you, father—"

"But an hour!" wailed the old man, "when you have been away from your father's fireside for seven years—"

"I will be back, perhaps in a week or so," promised the son, "for a longer stay. But right now only an hour; then I must go to Signore Cassini's observatory and work through the night."

"Through the night! What is this work you have to do, Enric?"

"I am a mathematician, Father, and all night I will be working with pen and paper, helping Cassini and Halley plot the course of the comet in the sky."

M. Brignaic turned pale.

"My son, what have you to do with that object of evil which will engulf the world in fire and destruction—"

It took the young mathematician many minutes to explain to his agitated father that the light that hung in the sky, despite its awesome aspect, was only a heavenly body millions of miles away, something as harmless as the stars.

"DON'T you understand?" cried the son. "Ah, when will the light of science and reason clear the minds of men? Listen closely, Father. The earth is a ball, a globe. It circles through space around the sun, as do all the planets with their satellites. And that thing which has terrified the people is nothing but another member of the Solar System, whose orbit is as yet unknown.

"But tonight, or soon, Dr. Halley, with the help of Cassini and his telescope, will plot its heavenly course, and if Dr. Halley is right it will mean one of the greatest discoveries of all time! He already suspicions that a comet has a closed orbit which will bring it back to the sun periodically. Our figures and calculations will show us whether it is so or not. If we—"

"Enric!"

The son stopped, suddenly realizing he had been forgetting that his father could understand nothing of those things.

"Enric, you bewilder me with those words. But tell me one thing and I'll be satisfied—is it true that the—the comet, as you call it, will not—will not—"

"Destroy the earth?" finished Enric, smiling. "I swear to you by all that is holy, father, that such a thing cannot occur! Reason forbids it!". . . .

CHAPTER IV

Men on a Comet

WITH a sullen drumming of several hundred sturdy rocket-tubes, the space ship *Discovery* slid away from Earth gracefully and arrowed out into the void. Long and slender, equipped with wings for atmospheric navigation, the shaft of beryllium accelerated steadily under the power of its rocket engines. Its hungry valves were fed by the pale blue Trinotex liquid, several hundred times more powerful than gasoline.

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Inside, an hour later, when Earth's atmosphere had been navigated without accident, Captain James Willoby, Am-NY-b-22, class A Cosmicon—or space navigator—looked over the list of his crew carefully. Each time he came across a name familiar to him, mostly Class A and B Cosmicons, he lifted his brows in pleasure. A wonderful crew of men. A half hundred stalwarts inured to the hardships of space travel, unaffected by the incapacitating space-nausea, and undisturbed by a lack of normal Earth's gravitation.

The door opened to the captain's office and First Officer Milton Jones entered, saluted and stood respectfully at attention. Jones was a fine, upstanding young man with an alert way about him that Captain Willoby liked. Furthermore, he was an Am-NY-b—in plain words, American Continent, New York City, and class "B" intelligence. Class "B" was topped only by class "A."

"Any special orders, Captain?"

"No, no," returned Willoby. "Usual routine—three watches, turn about. Three men at controls. One man at meteor deflector. Regular engine crew. Oxygen inspection every hour, etc. However, I want three men at the radio—Venus, Mars and Earth connection at all times. The information we pick up is too important to risk missing."

"Yes, Captain."

"By the way, Jones," said the captain, dropping formality, "how do you feel about this whole thing?" There was curiosity in his voice, and friendliness.

The first officer unconsciously relaxed at the comradeship offered in his superior's tones, and a radiant glow lit up his face.

"Grand, Captain! I feel that this is a great honor for all of us, and I for one was overjoyed when my application was accepted. I've been to Mars, sir, and to Venus, dozens of times; but believe me, *this* is altogether different. There's a sort of—of"—he groped for words — "adventurous thrill! Like going to another star!"

The captain nodded. Involuntarily their eyes swung to the lee port where in the blackness of the airless void a long sweeping cone of shimmering light with a dazzling apex hurtled among the calm stars. Eight centuries ago Dr. Halley had plotted the elliptical orbit of the comet that bore his name. Little did he realize then that posterity would eventually reach it in a space vehicle, to examine it at first hand!

Captain Willoby and his daring crew, commissioned by the Earth Federation, were soaring out with drumming rockets to meet the comet which every 76 years since time immemorial had careered past Earth, a constant challenge to humanity's thirst for knowledge.

ALTHOUGH space ships had been plying between the inner planets for two centuries, and though ships had returned from distant Saturn safely, the attempt had never been made to fly to a comet. The ship *Discovery* would be the first in that pioneering move. Needless to say, a world was breathless behind them, waiting for its sons to radio back what they would find.

As First Officer Jones left the captain's office to transmit his orders, Oberton, the course-plotter, entered.

"I have made the final checks, Captain, and the course is down on this chart. Barring accidents, it should be easy. The comet is coming at a gradually increasing speed as it is nearing perihelion. It will pass the orbit of Mars at its own elevation from the ecliptic in an hour. Our ship, following this course, will draw into the fringes of its tail, five million miles back of the head, three days from now. Then it is simply a matter of increasing speed and drawing up into the tail.

"At the prescribed rate previously agreed upon, we will catch up and reach the nucleus before the orbit of Venus is reached. Beyond that it would be dangerous to follow the comet as the sun's heat becomes intolerable and the speed of the comet accelerates too rapidly to allow us to duplicate it without danger."

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Willoby nodded, looked over the course-chart for a few minutes, and then okayed it with instructions to have it made in triplicate and put before the triplicate control boards in the pilot room.

At the end of the second day Captain Willoby called the scientists together in the ship's observatory, a dozen earnest and eminent savants of Earth. Looking from one to the other of their eager faces, he spoke:

"Gentlemen, in ten hours our ship will draw into the tail of the comet, five million miles behind the nucleus. As per your request, my crew will pull the ship up into the tail, gradually approaching the nucleus, which we will reach a week later. In that week you gentlemen must do all your testing and observing. My radio operators stand ready to transmit your data as soon as it is made. In this you must be prompt because—" he paused but one of the scientists finished calmly: "Because we may not live to carry the information back to Earth in person!"

"Exactly," nodded the captain. "We understand one another thoroughly. Now mind, I am not predicting disaster. We ought to come through it without the slightest danger. But because of the mere fact that so little is actually known about a comet, we simply do not know what will happen when we draw our ship up into the tail and crawl toward the nucleus."

"Rest assured," spoke one of the scientists gravely, "that we understand our position thoroughly. If we are to die, so be it."

Such was the spirit that drew the *Discovery* into the comet's tail, when its navigators could not know but what any moment some unforeseen, inexplicable destruction might engulf them. As they became surrounded by the ghostly luminosity of the tenuous tail, the scientists went furiously to work. Every few minutes they pumped in gas samples, and while part of their number analyzed the material chemically and electrically, the rest made all sorts of intricate tests with spectroscopes, electroscopes, and various meters.

THE skilled radio operators sent out continuous data, three separate lines of communication on different wave bands, to make certain that none of it would dissipate into the void of space. No ill or strange effects were noticed while the ship was enveloped in the tail, and the captain bored the ship ahead steadily.

For a long week the routine went on, while the scientists became excited over some of the new things discovered about the comet's tail. Gradually the gases became denser, although never did they approach the thickness of even a man-made vacuum tube's contents! Looking out of the ports, First Officer Jones could see the reaches of space as clearly as though they were in the absolute void, except that there was the faintest indication of fogginess on the glass.

Finally the nucleus of the comet drew near. Excitement reigned aboard. What had long been suspected, but never proved, was now seen to be unquestionable fact—the comet's head had a kernel of solid matter about ten miles in diameter! An hour later, after considerable discussion pro and con, Captain Willoby finally yielded to the scientists' pleadings, and maneuvered for a landing!

"But Captain!" First Officer Jones had said upon hearing the decision from his superior's own lips. "Isn't it dangerous? It looks from here that the solid lump of matter which composes the nucleus is very hot, perhaps molten. Surely the outside hull will gradually weaken—"

"I guess not, Jones," returned the captain. "The scientists tell me, and swear it up and down by all the gods, that the nucleus merely *looks* hot, but that it is really a sort of 'cold fire' that won't affect our hull at all. I'm going to chance it, Jones, because I think it's a shame to get this far and then turn back without landing. Think of it—we will be the first human beings to land on a comet's nucleus!"

Manned by a crew somewhat nervous because of the fearsome appearance of the glowing, fiery ball below

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them, the *Discovery* blasted its nose rockets powerfully, slid around the tiny lump of matter for three revolutions, and then *plumped* to the "ground" with a slight jar.

In the laboratories, twelve earnest scientists, hollow-eyed from lack of sleep but imbued with exultant spirit, silently set to work on their endless and intricate tests. The radio operators flashed the thrilling word to civilization—"We have landed on the comet's nucleus. It is solid. Stand by for data!"

Finally one of the scientists came stumbling into the captain's office where Willoby and Jones had been gazing out of the port and talking over the sensation of being on a comet.

"Captain!" the savant gasped. "Space-suits! There is no reason under the sun why we shouldn't step out there in space-suits!"

Captain Willoby started. That was a little more than he had bargained for.

"Are you sure it will be safe? Don't forget a space-suit is not as good protection as five beryllium hulls. Are you certain no dangerous radiations or rays will stab through the fabric of the suits and—"

A SCIENTIST broke in. "God, Captain!" he cried. "You don't think we'd suggest it without first making tests? Unless our instruments are all wrong, there is nothing out there beyond the five hulls that can harm a man in a space-suit. And as for the advantage of it—God, some of my colleagues say there is actually some sort of plant life out there! Quick! Space-suits! This is the greatest thing in all history! Space-suits, Cap—"

The scientist suddenly slumped to the floor. Jones picked him up, alarmed, but there was no concern in Willoby's face.

"Nothing serious, Jones. That fellow fainted from pure lack of sleep. He and the rest of those men—I can't help but admire them—are driving their tired bodies to the limit to get the most out of this. Take him to the doctor, Jones, and then report back here."

When First Officer Jones returned, the captain looked him over musingly.

"Jones, I like you. I'm going to give you a chance to go down in history—if you have the nerve!"

"I've got tons of it!" returned Jones, drawing up.

"Well, it's like this," went on the captain. "I can't let those scientists step out onto the ground out there in a space-suit without first having somebody precede them to see whether it's safe. I can't do it myself because of the Cosmicon rules that a captain must stay with his ship under all extraordinary circumstances. So if you, Jones—"

"Right, sir. I'll go right away."

"Good," nodded the captain. "Go out there by the front lock, and stay out for three hours. Don't wander more than a few hundred feet from the ship and—and watch yourself, my boy," he added tenderly. "Best of luck!"

A clumsy figure in a puffed out space-suit stepped from the air-lock of the *Discovery* and leaped lightly to the spongy ground. With a hundred envious eyes watching him, he strode forward among the queer knobs and tuft formations of the cometary landscape. The intense radiance surrounding him seemed like a licking flame about to consume him. Yet he did not falter as he walked around the ship in ever widening circles.

Once he stopped and picked up, after several trials with his stiff gauntlets, a flexible stalk of some strange, unearthly plant growth, and waved it aloft so that those in the ship might see. The scientists caught their breath and conversed excitedly, eager to go outside themselves. But the captain was adamant—only after Jones had survived three hours and come in unharmed would he let them sally out.

First Officer Jones felt like a god as he walked over the spongy surface of the comet's nucleus. And well he might, being the first man ever to tread the unearthly land of a comet that passes. . . .

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Science Questions and Answers

THIS department is conducted for the benefit of readers who have pertinent queries on modern scientific facts. As space is limited, we cannot undertake to answer more than three questions for each letter. The flood of correspondence received makes it impractical, also, to promise an immediate answer in every case. However, questions of general interest will receive careful attention.

WHAT IS GRAVITATION?

Editor, Science Questions and Answers:

If, as Einstein's latest generalization seems to imply, gravitation and electro-magnetism are more or less similar forms of the universal energy, is it to be assumed that there may be surrounding every material body or group of bodies a gravitational field somewhat allied to the magnetic field adjoining a magnet? If so, may it not be that gravitation extends only a measurable distance beyond our and other galaxies and is, therefore, NOT ACTUALLY UNIVERSAL in space?

I do not know that there is any objective evidence or proof that mutual inter-relations exist between our galaxy and other universes myriad millions of light-years distance in the void.

There seems to be some evidence that our Solar System is moving as a unit among the stars and, perhaps, that our galaxy is turning on an axis of its own. Maybe it is a gigantic gyroscope forever whirling in one plane in one corner of "space"!

W. S. V.,
La Habra, Calif.

We believe that there is much to substantiate the view that "universal gravitation," as we see it, may be only the way that the attraction between material bodies manifests itself in the neighborhood of our earth, that is in our Solar System. We have very little evidence that the inverse square law of Newton holds throughout the entire Universe.

Science has not yet been able to explain the basis of gravitation. Assuming that interstellar space is empty, science has not yet explained why two bodies can attract each other across the gulf of emptiness. The ether was invented some years ago as a device which might explain gravitation. That is, assuming there was an ether, the force of gravitation could be exercised by disturbing the ether in some unknown way.

One new theory claims that there is an ether filled with radiations of so short a wavelength that it pervades all matter. Nothing can stop it. This radiation, like light, exercises a pressure in all directions. When it passes through a material body, however, part of the radiations are changed and some of them lose their pressure-producing power. Now if there were only one body in the Universe, nothing resembling gravitation would occur for the change in radiation would be the same in every direction. But given two bodies as the earth and the moon the space between them is filled with a great deal of the pressureless radiations. Inasmuch as both bodies have pressing on them the pressure producing radiations there exists a tendency for the bodies to draw together. This tendency is called gravitation. Although this theory is open to many arguments it is an approach to an understandable gravitational phenomenon that might act universally.—Ed.

VISIBLE LIGHT BY RADIO

Editor, Science Questions and Answers:

Are radio waves, cosmic rays, ultra-violet rays, X-rays and heat and light rays the same, only of different frequencies? And is it possible with the proper apparatus to construct a radio transmitter which would send out waves so rapidly that they would be visible, as visible light?

C. N.,
Engadine, Michigan.

Radio waves, heating radiation, infra-red rays, visible light, ultra-violet rays, X-rays, gamma rays and (presumably) cosmic rays are fundamentally similar, but differing in frequency and consequently in wavelengths. This difference causes them to have varying effects upon matter which lies in their path. For instance, only those rays are visible which are of a suitable length to produce a chemical change in the molecules of "visual purple" on the retina of the eye. The ultra-violet waves are too short and the infra-red waves are too long.

The shortest wave which a radio transmitter can set out is limited by the electrical constants of the apparatus, and this in turn cannot be separated entirely from its physical dimensions. For that reason, it is impossible to build a transmitter which will send out in the ordinary manner waves only 1/30,000-inch long. The shortest "radio" waves which have been produced were about 1/30 to 1/300-inch long (estimated); and were generated, not by a transmitter, but by causing a current to jump between iron filings which were mixed with insulating oil. If the same process were applied with such energy as to produce in the iron molecular motion, which would cause

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rays, between 1/70,000 and 1/35,000 wavelength to be emitted, the result would be light. We would not consider the result to be "radio" waves, however.

As radiation becomes higher in frequency and shorter in wavelength, it loses the characteristic which we associate with "radio," and assumes those which we associate with light. Radio below one meter wavelength is quasi-optical.

THE VALUE OF PI

Editor, Science Questions and Answers:

Has an exact value for PI ever been worked out? If not, for how many decimal points is it known?

A. W.,
Sydney, N. S., Canada.

Pi, which is one of the most fundamental values in mathematics, is the quantity by which the diameter of a circle must be multiplied to obtain its circumference, and its value is not known exactly. Archimides in attempting to find the relationship between the diameter of a circle and its area stumbled across this elusive pi. It is known to 700 places. Calculated to 35 places by Ludwig Van Ceulen, these figures were carved on his tombstone erected in 1610.

3.14159265358979323846264338327950288

By this figure it is possible to calculate the circumference of a circle immensely larger than that made by our Solar System, with an error too small to measure by any known means. The figure, then, for all practical purposes, is a perfect one.—Ed.

THE ROCKET IN SPACE

Editor, Science Questions and Answers:

If oxygen is necessary for burning or combustion, how would a rocket burn its fuel in space? I have heard many people say that a rocket will operate in space, therefore I ask this question, since there is no oxygen in space. And what is the most powerful of known fuels? How well does it supply the requirements to shoot a rocket beyond the earth's attraction? From what I understand, it takes an enormous amount of fuel to make an interplanetary rocket flight.

A. B., N. Y., N. Y.

Because there is no oxygen in space, a rocket must carry all of its own fuel. That fuel will be either hydrogen, gasoline, alcohol or possibly some other hydrocarbon. The oxygen to burn or consume it will be carried on the ship also in the liquid form. By having the oxygen as a liquid, a great deal more of it can be contained in a given space. There is consequently a great saving in container weights, which is very important.

If it were not necessary to carry along oxygen on a rocket voyage, and it could be obtained from space, as an airplane obtains it from the atmosphere, the problem of an interplanetary voyage would be speedily settled.

For your second question, as a matter of fact, the energy required to make an interplanetary flight by rocket is considerably beyond that available in present fuels.

There is necessary 21,000,000 foot-pounds of energy to shoot merely one pound of weight beyond the earth's attraction. This does not include the air resistance nor does it take into consideration the fuel necessary to steer a rocket in space or make a landing upon another world and finally make a safe return to earth.

The most powerful of present known fuels is the mixture of liquid hydrogen and liquid oxygen, which on perfect combustion yields per pound, some 5,500,000 foot pounds of energy. It is evident on the face of it that the fuel could not even carry its own weight beyond the earth's attraction, not to say lift a space ship, passengers, equipment, etc. However, by the step rocket principle, the fuel requirements are reduced to some 15,000,000 foot pounds per pound of weight, and calculations show that the fuel could just about lift itself.

To explain, as fuel burns, it is ejected from the rocket and therefore the weight of the remaining fuel is reduced. The average weight of a pound of fuel lifted during its burning is possibly ⅓ pound. Therefore if we start with three pounds of fuel, with a total energy of 16,000,000 foot-pounds, it will be required to lift beyond the earth's attraction an average of only one pound or 15,000,000 foot-pounds.—Ed.

YOUR FAVORITE SCIENCE FICTION WRITERS

o o o

Manly Wade Wellman
Myer Krulfeld
Raymond Z. Gallun
Eando Binder
Frank Belknap Long, Jr.
Hal K. Wells
D. L. James
Jack Williamson

—and Many Others in Forthcoming Issues

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IN this department we shall publish your opinions every month. After all, this is YOUR magazine, and it is edited for YOU. If a story in THRILLING WONDER STORIES fails to click with you, it is up to you to let us know about it. We welcome your letters whether they are complimentary or critical—or contain good old-fashioned brickbats! Write regularly! As many of your letters as possible will be printed below. We cannot undertake to enter into private correspondence.

SUGGESTIONS

By J. J. Demaree

Have just read T. W. S. and think "Lost in Time" and "Menace from the Microcosm" the best of the novelettes with "Black Vortex" and "Green Hell" leading the shorts.

But here's something I'd like to see. "The Story Behind the Story" has made me curious about our authors. How about one or two biographical sketches each month about them—where they live, what they look like—you know. You could take them alphabetically — Binder, Burks, Cummings, Campbell through to Wandrei and Zagat. How's about it?—Los Angeles, Calif.

(Well, readers, how about it? Would you like to see such a department added to T. W. S.?—Ed.)

PENTON AND BLAKE WANTED

By Philip McKernan

Thanks for the swell cover on the August issue of THRILLING WONDER STORIES. By all means retain Mr. W for both covers and story illustrations.

The only story I didn't care for was "The Solar Menace," and this story took up so little space that it detracted little from the issue as a whole.

Please delete, dismiss and discontinue ZARNAK.

My vote for the best story in the issue goes to "Conquest of Life." Keep up the good work, Binder. I enjoyed "The Double Minds" by John W. Campbell, Jr. and I sincerely hope he writes many more Penton and Blake stories.

I hope T. W. S. can maintain the high standard it has set, for, in my estimation, it is the best science fiction magazine that is being published; and, incidentally, the least expensive.—827 Greenwood Ave., San Mateo, Calif.

COVER LIKED

By Robert A. Madle

Congratulations on the best issue of T. W. S. to date. The cover was very good; quite typical of Wesso. Let's have Wesso paint more covers for forthcoming issues of T. W. S. He is far ahead of the others, with the possible exception of Paul. The fictional content was up to the standard set by the previous issues; the best story being Binder's "Conquest of Life." It pleases me to note that Eando Binder is a regular contributor to your magazine. I also liked Gordon A. Giles' "Vision of the Hydra." It was very well written, and the idea voiced has its possibilities. Campbell's new series is very good, and having a Penton and Blake story in every issue would suit me swell.—333 E. Belgrade St., Philadelphia, Penna.

ABOUT TELEPATHY

By F. L. Sulloway

I was surprised to read your answer to B.D. of Boston, Mass., in the August department for Science Questions and Answers. Telepathy has been fairly well substantiated by the recent investigations of Dr. J. B. Rhine, of Duke University. Is it possible that his work has escaped the attention of B.D.? Rhine's book on "Extra-Sensory Perception," published in 1935 by Bruce Humphries, should acquaint him considerably with this subject. "The Journal of Parapsychology," a publication of the Duke University Press, the first number of which came out last March, also outlines many conclusive proofs.

Telepathy is at present a definite object of study at a number of universities and colleges. The results obtained by Dr. Rhine are too startling, and the statistics he has amassed are too overwhelming to be lightly dismissed.

B.D. will find an admirable outline of the recent progress made along these lines in "Harpers" magazine for November, 1936. As one who has been associated with Dr. Rhine and who has duplicated many of his results, I feel distressed that B.D. has not seen some of these publications. Telepathy is rapidly developing into an established branch of psychology, and I would be glad to correspond with anyone who is attracted by this subject.—R. F. D. 1, Branford, Conn.

WANTS REALISTIC YARNS

By Jerome Keeley

Irregularly, since there was but one such publication on the market, I have been reading science fiction magazines. T. W. S. is by far the best I've ever seen, especially recently.

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A little while ago I made the acquaintance of your magazine while searching the newsstands for this type of fiction. On the spot your mag looked so well I bought it at once. I knew a good thing when I saw it. So much complete fiction, excellent features, depts., etc., cannot be secured at any price.

My vote is cast for stories with background or local color in which the reader can identify himself. It's up to your authors to keep the tone of their stories convincing and realistic.—North Sutton, N. H.

ZARNAK GOOD

By Walter Walters

After hearing what the rest of the T. W. S. fans have been saying about "Zarnak," I decided to write a letter. I have been reading your books since the first edition and find them interesting and educational. Every time I read a story I drag out all the books I can find to supplement the information I've obtained. Your stories stimulate me to do so. "Zarnak" is very good, and I wish you'd tell Max Plaisted to keep up the good work. I find that T. W. S. is the best magazine on the market. You are improving more and more with every number.

C. C. Wilhelm, one of your readers, lives in the same town I do and I see that we have the same ideas on stories. I wish he would write to me.

"Conquest of Life," by Eando Binder was the best story I have read in months. "The Iron World" was close behind. The August issue of T. W. S. was the best you have produced to date.—101 West Maple Ave., Glendale, Calif.

BRICKBATS

By John Giunta

Here's my opinion of THRILLING WONDER STORIES. Your mag has improved a lot, following its course from the first issue. Your stories are very good, same for your authors. I was exceptionally pleased to hear that Neil R. Jones and John W. Campbell, Jr., were some of the writers. Here are some of my suggestions: Why not have a serial now and then? How about having a book length novel every other issue? Also, enlarge the picture strip, "Zarnak."

Now cover your heads for the brickbats. In nearly every issue of your magazine we have stories of cosmic doom, interplanetary doom, the end of the Universe, Earth, etc. You get tired of that variety of story. Science magazines are not to write stories featuring death, etc. The purpose of the science fiction story should be to cover every field of science. Have your authors take note.—1355 80th Street, Brooklyn, N. Y.

T. W. S. O.K.

By John V. Baltadonis

All the yarns in the August issue are very good. However, two stories stand out above the others. They are "The Double Minds" and "Conquest of Life." Another story that was pretty entertaining was Otis A. Kline's "The Iron World."

Your science article, "Spaceward," by P. E. Cleator, was very interesting. Let's have more of the same type.—1700 Frankford Avenue, Philadelphia, Penn.

ORCHIDS AGAIN

By Frank Skerbeck

Do you know, I am really getting alarmed at the way THRILLING WONDER STORIES has been improving during the last year? It seems impossible that you can continue to improve. I shall be easily satisfied with it if you keep the magazine at the same fine level it is now maintaining.

Each one of Binder's last three stories has been better than the last, which is saying something! And Campbell's "The Double Minds" was equal to "Conquest of Life." A science article like "Spaceward," which was excellent, adds 25% to the magazine's value. You can certainly be proud of putting out such an all star issue at such a low price.

Some of the other stories that I liked in the last few issues were Williamson's "The Ice Entity," "The Astounding Exodus," by Jones, "A Million Years Ahead," by Hamilton, and "Vision of the Hydra," by Giles. There were, of course, many other stories of equal and nearly equal merit. I mentioned the ones that impressed me the most.

Had I written this letter a month or two earlier I would have had a good many criticisms and suggestions to offer. Now they all seem superfluous. In closing, let me ask for foreign readers to correspond with me. I will answer all letters promptly. —Iron River, Wis.

GOOD NEWS FOR PENTON AND BLAKE FANS!

THE TENTH WORLD

A Novelette by JOHN W. CAMPBELL, JR.

—IN THE NEXT ISSUE

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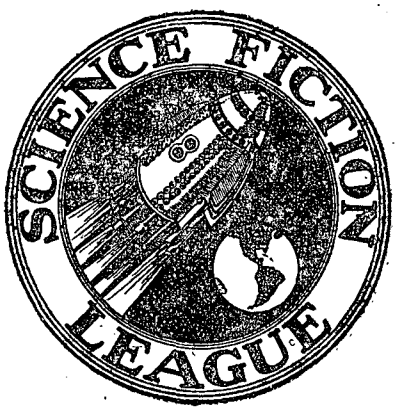

The SCIENCE FICTION LEAGUE

A department conducted for members of the international SCIENCE FICTION LEAGUE in the interest of science fiction and its promotion. We urge members to contribute any items of interest that they believe will be of value to the organization.

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THIS age has been defined by many names. But it is safe to say "The Age of Electricity" best conveys the impression it has created among all thinking people.

The postage stamp is giving way to the telephone. For one can now phone to practically every important civilized city in the world.

MODERN WONDERS

The crank on the automobile bows in respect to a little button which you step on with your left foot. A twist of a dial on the radio and listeners in San Francisco hear a speech being made in London.

The wonders of the moving, talking, and television pictures need no comment here. We have electric fans to cool us in summer, electrical heat to keep us warm in winter. We make ice, fry eggs, polish shoes, squeeze oranges, press our clothes and run many of our trains by electric power.

THE AGE OF ELECTRICITY

The candle taper has been generally replaced by a switch. In many States we even kill our murderers by electricity.

Yet, for every life we take with this mysterious fluid or force or substance —for we do not even know what it is —there are thousands of useful lives saved.

For instance, the X-ray makes it possible to explore the deepest recesses of the body, and bring to light the hidden menace of disease. The application of electricity in its various forms helps heal tubercular lungs, removes deep-seated growths, and performs other miracles of healing.

We can congratulate ourselves for living in an age which recognizes the wonders and comforts afforded by that marvelous power—electricity.

THE FUTURE

To many people, some of these achievements represent the summit of human progress; greater accomplishments are deemed impossible. But our contemporary science fiction writers think otherwise. They look forward to the day when man will defy gravity, control the elements, conquer interplanetary space, harness the power of the sun, and utilize the tremendous energy of the atom. Such visions of the future may seem fantastic now; but, as the years roll by, they will be transformed into reality, even

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as Verne's fancies of the submarine and airplane have been realized today!

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Join the SCIENCE FICTION LEAGUE! It's an organization of the world's most enthusiastic followers of imaginative fiction—and it fosters an intangible bond between all science fiction readers.

Just fill out the membership application blank provided on this page. There are active members and chapters in every part of the globe.

To obtain a FREE certificate of membership, tear off the name-strip of the cover of this magazine, so that the date and the title of the magazine show, and send it to SCIENCE FICTION LEAGUE, enclosing a stamped, self-addressed envelope. We will forward you, in addition to the certificate, further information concerning LEAGUE activities. And readers—write the editor of THRILLING WONDER STORIES regularly, giving all your opinions and comments concerning this magazine! Your suggestions and criticisms are welcome! Keep them coming!

THE SCIENCE FICTION LEAGUE

—a department conducted for members of the international Science Fiction League in the interest of science, science fiction and its promotion. We urge members to contribute any items of interest that they believe will be of value to the organization.

There are thousands of members in the League with about forty chapters in this country and abroad, and more than that number in the making all over the world.

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Science Fiction League,
22 W. 48th St., New York, N. Y.

I wish to apply for membership in the SCIENCE FICTION LEAGUE. I pledge myself to abide by all rules and regulations.

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Occupation ..... Hobby.....

I am enclosing a stamped, self-addressed envelope and the name-strip from the cover of this magazine (tear off name-strip so that the name THRILLING WONDER STORIES and the date can be seen). You will send me my membership certificate and a list of rules promptly.

10-37

FOREIGN CHAPTERS

Leeds Science Fiction League (Chapter No. 17). Director, Douglas W. F. Mayer, 20 Hollin Park Rd., Roundhay, Leeds 8, Yorkshire, England.

Belfast Science Fiction League (Chapter No. 20). Director, Hugh C. Carswell, 6 Selina St., Belfast, Northern Ireland.

Nuneaton Science Fiction League (Chapter No. 22). Director M. K. Hanson, % Mrs. Brice, Main Road, Narborough, Leicestershire, England.

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Barnsley Science Fiction League (Chapter No. 37). Director, Jack Beaumont, 30 Pontefract Road, Barnsley, Yorkshire, England.

OTHER CHAPTERS

There are other domestic Chapters of the LEAGUE, fully organized with regular meetings, in the following cities. Addresses will be furnished upon request by Headquarters to members who would like to join some local branch. Chapters are listed chronologically according to Charter:

Lewiston, Ida.; Erie, Pa.; Los Angeles, Calif.; Monticello, N. Y.; Mayfield, Pa.; Lebanon, Pa.; Jersey City, N. J.; Lincoln, Nebraska; New York, N. Y.; Philadelphia, Pa.; Oakland, Calif.; Elizabeth, N. J.; Chicago, Ill.; Tacoma, Wash.; Austin, Tex.; Millheim, Pa.; Bloomington, Ill.; Newark, N. J.; Stamford, Conn.; Denver, Colo; Lakeport, Calif.; Ridgewood, N. Y.; Woodmere, N. Y.; Beckley, W. Va.; Tuckahoe, N. Y.; South Amboy, N. J.; Pierre, S. Dak.; Albany, N. Y.; Boonton, N. J. and Flushing, N. Y.

YONKERS SCIENCE FICTION LEAGUE

O. Davidson announces the formation of the YONKERS SCIENCE FICTION LEAGUE, a new chapter of the SCIENCE FICTION LEAGUE. Other charter executive members are Laurence Picard and Raymond Myron Glueck. All readers of THRILLING WONDER STORIES residing in Yonkers or nearby are urged to get in touch with Mr. Glueck, the secretary, at 1 Post Street, Yonkers, New York.

CHAPTER NEWS AND GENERAL ACTIVITIES—LOS ANGELES

Past 6 months meetings have pyramided in popularity. Ever since Xmas, at which time was experienced scientificelebration which went off with a bang. A 4 hr. s-f festival attended by 21. Seen were scientifantasy filmementos from Metropolis, Frankenstein, High Treason, Mummy, FP1, King Kong, Lost Souls' Isle, Deluge, Invisible Man, Vanishing Shadow, Invisible Ray, Undersea Kingdom, Flash Gordon, Things to Come. . . . Also snaps: s-f fans & authors; kodax: solar eclipse, experimental rockets, clay model Martian; etc. & exhibited: bound stf excerpts from early Science & Inventions ("Man from Atom, Around Universe, Metal Emperor," etc.), Argosyarns "Blind Spot" "Radio" series, etc.; stf items from Eng. fan mags.

Regular business brought resignation Director Hofford due inability to continue coming, unanimous election Treas. Russ Hodgkins to companion position Dir. Desirability guest book for visitors' signatures discussed.

Guests at gala Yuletide gathering included Alden L., League member brother 1st Class member Forrest J. Ackerman, & Exec. Ack's mother and father, from Frisco; Dave Stolaroff, Nex Mex.; Baron Karl Edward Forst von Luetz of Bev'y Hills, Esperantist & now Chapter Sec'y; Locodo—engaged in translating latest revolutionary reports from Prof. Szekely, Cluj College, Romania, whom regular readers these columns will recall for his

(Continued on Page 124)

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The Story Behind the Story

MORE than a decade ago Ray Cummings created one of fantasy fiction's most famous personalities — blundering, portly "Tubby," scientific experimenter. Since that time the amazing adventures of that likeable character have become classical. "Tubby" stories have been prominently featured in more than a dozen national magazines; in each case they have immediately won unusual popularity.

Tubby has circled the Universe, probed the cosmos and explored many strange dimensions in the more than two-score episodes of his career. But certain of Tubby's colorful exploits have yet to be chronicled for posterity. We assigned the job of reporting these accounts to versatile Author Cummings. THE SPACE-TIME-SIZE MACHINE, in this issue, inaugurates the new Tubby series, to appear exclusively in THRILLING WONDER STORIES. How Cummings' initial Tubby yarn landed in print makes amusing reading, and is a story in itself. Listen to the author:

THE RETURN OF TUBBY

Your readers seem interested in having the author comment upon his story; and in connection with THE SPACE-TIME-SIZE MACHINE I have a few words to say.

It is my first revival, after many years, of two characters—Tubby and Sir Isaac Newton Wells Verne. They made their initial bow in the second story I ever wrote. I had sold "The Girl in the Golden Atom" to the Frank A. Munsey Company—and in a burst of youthful enthusiasm, I created Tubby and Sir Isaac. The story was, I recall, "The Man Who Discovered Nothing."

I took it to the Munsey editor—the famous Bob Davis. When he had read it, he sent for me. I found him frowning at me across his desk, with the manuscript between us.

"Do you know what you have done in this story?" he demanded.

"What have I done?" I stammered.

"You've burlesqued your own talents. You've taken the 'Girl in the Golden Atom' and torn it to shreds." He tossed the manuscript at me.

"Then you're not going to buy this one?" I suggested.

"Buy it? Do you think I'm crazy? It belongs in the wastebasket."

That hurt my feelings. With great dignity I gathered it up and put it in my leather brief case. I was a novice author then; I had a very handsome brief case in which to carry my precious manuscripts.

"Aren't you going to burn that story?" Bob Davis demanded—or words to that effect.

"I'm going to sell it to some other editor," I declared.

He grinned and reached for it. "All right," he said. "Hand it over. I can stand it, if you can. But it's terrible."

He published it and a string of others to follow. And so I thought that the readers of THRILLING WONDER STORIES might be interested in a revival. Sir Isaac, I think, is a fair personification not only of all authors of science fiction, but of your readers as well. And that makes him a very learned personage indeed. Don't you think so?

THE FIRELESS WORLD

HAVE you ever thought what life would be like on a planet where fire was mechanically impossible? Just how would a progressive civilization surmount such an obstacle? Penton and Blake, our dauntless space-rovers, blunder into this problem in THE IMMORTALITY SEEKERS, a new novelette by JOHN W. CAMPBELL, Jr. Their latest little jaunt takes place on Jupiter's satellite, Callisto, and the experiences of these two Earth-exiles on that world make interesting reading. But first, a letter from Mr. Campbell to explain his theme more fully:

The story THE IMMORTALITY SEEKERS rose, as I suggested, in connection with the previous story THE DOUBLE-MINDS, from the considerations of what problems would face an intelligent race on a world where fire was, for some quite-possible reason, impossible. How, under such circumstances, would man, for instance, have developed? Metals would have become available only with the development of a very high order of civilization. Only within the last 50 years or so, would Man have known metals other than silver, gold, platinum and others which occur uncombined in nature.

The possibilities of using life-cells I have suggested; a full development of the theme might well occupy a 50,000 word novel. That utilization of life-cells would be almost the only practicable industrial manipulations available to them, I think can be shown fairly definitely. That such extreme manipulations as I suggest are possible, though not yet accomplished on Earth, I maintain. So far as the electric power plant goes, consider this: since water is a conductor of electricity, and when a voltage greater than about 3 is applied, it breaks to hydrogen and oxygen, it seems evident that no electric cell, using one solution, wet by one mass of water, can develop more than 3 volts. If it developed more, the water would short-circuit it internally, wasting its power.

This has been a fairly generally accepted limit. But—an electric eel, with one bloodstream, in one continuous body-solution, develops 900 volts or more! Nobody yet knows how it can possibly be done, but the animal does it just the same.

"Pipeline," based on a body-chemistry of boron, is not impossible, or wildly improbable, and illustrates another point where our knowledge of chemistry is very, very faulty. By all that's good and holy in chemistry, boron has a valence of three, that is, can combine with only three hydrogen atoms at a time to form BH_3 for instance. Or it should combine with two hydrogens, another boron atom similarly combined linked to it being the third valence, thus:

```
H     H
  B—B     while four-valent carbon forms
H     H

H     H
HC—CH.  But, boron actually forms a com-
H     H
```

pound showing, apparently, four valences,

```
      H     H
thus HB—BH.  Just how it does this is still
      H     H
```


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something of a mystery, but that it does is known. Thus, there are only three known elements that have the property of combining with other atoms of the same element into complex substances; Carbon, on which all known life is based, Silicon, very similar, but heavier than carbon, and Boron, lighter than carbon, and somewhat more active.

ATOMIC LIFE

WHEN THE EARTH LIVED by HENRY KUTTNER deals with a pseudo-scientific theme that is daring—and different. The possibility of other sentient atomic worlds than our own has been suggested by some of our greatest scientists. Such an initial premise serves as the structure for a top-notch science fiction yarn. Here's how Mr. Kuttner conceived the idea for his story:

WHEN THE EARTH LIVED grew out of nothing. I was at my typewriter staring vaguely into space, casting about for an idea—something which hadn't been done before in science-fiction—and having little success. There didn't seem to be much left to write about any more.

Then I looked at the bookcase. A faint glimmer of an idea came to me. Suppose—just suppose—that bookcase suddenly came to life! Sheer, incredible fantasy, but that's the way stories are born.

The rest was comparatively easy. What could bring life to a bookcase? The thing wasn't homogenous; there was wood and metal and leather and ink making up the whole—but every part of the bookcase and its contents had one thing in common: atoms.

But how can atoms live? Well, after all, what is life? Nobody really knows. The filterable virus is on the borderline between the living and the non-living. And if life can come to a liquid, why not to a solid—or an atom? Nobody knows what electricity is, for that matter. I followed the analogy; electricity can be carried through conductors; similarly, life itself (granting the basic pseudo-scientific premise of temporarily believing in an unproved theory) can energize materials which ordinarily do not live. And I must admit that the idea seemed to me a fascinating one; my imagination was piqued by the tremendous possibilities of such a theme. The story is fantastic, yes—but the basic theory, I contend, is by no means an unscientific one, nor can it be disproved. And, anyway, I had a lot of fun writing the tale.

I'd like to say, too, that the Los Angeles Chapter of the Science Fiction League—most of whose members know more about science than I do—was really responsible for the growth of the yarn, as the interest evidenced by the gang gave me sufficient enthusiasm to write it.

THE RIDDLE OF RELATIVITY

A SPACE-TRAVELER vanishes in a mysterious ether-eddy of the Universe only to reappear years later—physically unchanged! That's only the start of CAVERN OF THE SHINING POOL, a gripping novelette of the strange forces existent in the Cosmos. ARTHUR L. ZAGAT is the author, and to us this seems his best tale to date. We hope you think so too. And now let Zagat tell you why authors enjoy writing science fiction:

There is a peculiar satisfaction in writing scientific fiction. It stems, I believe, from the fact that in this field, more than in any other, the author can cloak with the garments of

(Continued on Page 122)

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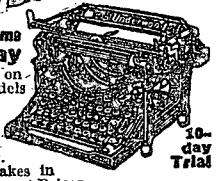

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(Continued from Page 121)

his imagination the intangible, ethereal speculations upon the nature of philosophical relations that otherwise must remain in the realm of the metaphysical.

CAVERN OF THE SHINING POOL is a case in point. While the adventurers of Jay and Gurd Silton are exciting enough, it was not their hazards and the way they met and overcame them that intrigued me, not the strange turtle creatures of that other space that spine-thrilled me in their creation, but the shattering of ancient, ingrained concepts of now and then, of up and down, of here and there, that were an inevitable concomitant of those adventures and those hazards.

There is, across the heavens, a "vague intangible veil" beyond which lies—almost anything. There is, across man's knowledge, a "vague intangible veil" beyond which lies—**almost anything.** Cold, soulless mathematical formulae lead us to conclusions more wildly romantic, more incredibly esoteric, than the dreams of Scheherezade, than the imageries of Poe. What is the ultimate truth? What is the ultimate reality? Is Einstein a mathematician or a poet? Is Eddington a physicist or a dreamer? Look you, if by mere motion up can become down, down up, today tomorrow and tomorrow yesterday, what assurance have I that you exist at all? How do I know that there is anything at all but me?

I know I exist. Descartes said it (or some figment of my imagination I chose to call "Descartes"). **Cogito, ergo sum!**

ASTRONOMY'S WONDER

THERE is no celestial body more thrilling to behold, more fascinating than a comet. The intriguing story of the destinies a comet may have influenced provides the theme for EANDO BINDER'S newest novelette, A COMET PASSES:

We smug humans sometimes fail to take into account the shaping of our destinies, personal and collective, by Nature at large. On the small scale we have the emotions and instincts molding much of our life. On a large scale we have floods, earthquakes and overpopulation to interrupt the plans of masses of people. Natural phenomena in their manifold forms twine themselves most intimately with human affairs.

The visitation of a comet, though now relegated by science's cold reasoning as only a mere spectacle, was in former times a powerful mental agent. It was from the unknown, and as such could play a disproportionate part in the superstition-ridden past. Only the sun outrivals a cometary display, but the latter has overtones of weirdness and terror.

Some time ago, in reading a one-volume history of the world, it struck me that comets were mentioned rather frequently. It seems that many of the ancient and especially Middle Ages' writers linked comet apparitions with plagues, wars and changes. In a sense, those writers were right, not knowing it themselves. They spoke of the comet **causing** these events in a physical or psychical way, when it could really only be in a purely psychological way.

We have no absolute records of important human decisions swayed by comet appearances. It may be just a remarkable coincidence that the Normans invaded England in 1066 when the brilliant Halley's comet made its periodical rounds. And all other such confluxes of comets and human events may be coincidence. But it is interesting to suppose that chains of happenings were forged in a cometary flame.

Out of more or less fanciful day-dreaming of this sort popped A COMET PASSES—a tale of what **might** be several out of a thousand or million similar incidents in Earth's misted past. We today gaze upon a comet—if we are lucky enough to have one in our lifetime—and realize why astronomers call it

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the most magnificent sight in the Universe. Our ancestors were lost to the beauty of the spectacle because of the mystery. There is no mystery to Halley's comet now, except how many human affairs it has upset in its scores of previous visitations.

"WHIZ-BANGS" OF VENUS

REMEMBER the "whiz-bangs" of Venus, as detailed in ARTHUR K. BARNES' recent story, GREEN HELL? They're in again, this time in a novelette of interplanetary exploration. Here's what Mr. Barnes has to say regarding the genesis of his stories of Venusian flora and fauna:

THE HOTHOUSE PLANET is an extension of the short story of mine that appeared in the April issue—GREEN HELL—with further of your humble contributor's deductions in regard to probabilities of life forms on the planet Venus, with particular stress on the animal life rather than flora. The portrayal of human behavior and character change, when caught in the flux of these strange conditions and outré creatures, lends the story substance of a sort, I feel.

As in the past, I have tried not to invent things that are too far removed from life as we know it on this Earth. The weird "whip," for instance, has its Earthly counterpart not only in the ant-eater, but in the sphinx-moth, which sports a hoselike tongue a good deal longer than its own body. Cousins to the "Venusian buzzard" can be found under any microscope in the biology lab. While the Murri, of course, finds its obvious image in the Proboscis Monkey . . . I do this because I feel that if a reader has some basis of comparison, when reading about alien life forms, he will be able to visualize the story more clearly and perhaps give himself an added measure of enjoyment and appreciation.

And now credit where credit is due. Arthur J. Burks may think he's pretty slick in contacting the local chapter of the Science Fiction League and pumping them for story material, but he's not the only wise guy in this man's town! I tried it myself, and believe me, everything he says about those fellows is true. We had quite a bull session one night at the home of Roy Test, clarifying my ideas and arguing new ones. Special mention of Al Mussen is only justice, as he was responsible for calling my attention to the existence, in experimental form, of the electronic telescope used in the yarn.

So THE HOTHOUSE PLANET is the result of rather diversified influences. I hope some of the readers may find in it a few minutes relaxation and entertainment. And after all, what more satisfaction than that can a lowly scrivener wish for?

GUIDE TO SCIENCE KNOWLEDGE ANSWERS

(See Page 37)

1—Page 16 in **The Hothouse Planet.**
2—Page 34 in **The Space-Time-Size Machine.**
3—Page 55 in **The Immortality Seekers.**
4—Page 71 in **Cavern of the Shining Pool.**
5—Page 81 in **Via Etherline.**
6—Page 103 in **A Comet Passes.**
7—Page 104 in **A Comet Passes.**
8—Page 111 in **A Comet Passes.**
9—Page 94 in **When the Earth Lived.**

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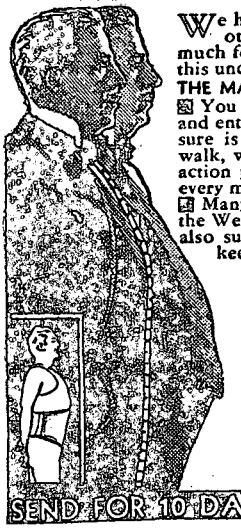

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THE SCIENCE FICTION LEAGUE

(Continued from Page 119)

Easter Isle expedition and discoveries, and utilization Universalanguage (Tomoro's Tongue: **Esperanto**) during group's world-round scientific search of elapsed life. Also her writer-artist son Mel from Perris, Cal.; Morogo, **Sekretariino de l'Esperanto-Klubo de Los-Angheleso** — skyrocketeer in Esperantic endeavor, longtime lover stf & now linked up with League—with her young son Vodoso, and nephew. Bob Olsen entertained with "4 Dimensional Magic." After his teasing Tesser Act prophetic presents were interchanged. Benefactor Bob, friend of fans, distributed gratis copies rare WONDERS and companion AIR WONDER. Exciting s-f raffles ensued rounding off epic eve.

At 1st New Year meeting our talented Publicity Director J. Barr inquired as to members' preference concerning sort song desired for Chapter Anthem which he volunteered to create — i.e. march tempo, manner moderne, or what. Pop consensus opinion centered on collegiate style chorus as most appropriate.

At 2d Jan. scientificircle "they laugh when he sat down to" irritate ye ivories but, undaunted, Exec. Ack executed (Who exclaimed "and how!"?) such songs suggesting s-f as "Stardust" and "Moonglow," "Dancing on Ceiling" (gravity nullified), "House's Haunted" (dead-icated "weird for weird" to fantasy flank: author-member Henry Kuttner, and artist-member James Mooney, Jr.) At preceding meeting members'd agreed J. Barr was "taps" when he sorta "shuffled off to Saturn." Now we hear from "Hank" (Henry K.) that "Bobby" Bloch (who writes fantasy fiction) is coming out to S. Karloffornia this summer and proposes to put on imaginative Minstrel show with co-op Chapter's chaps. Pseudo-science chain classic was commenced, each member adding couple paragraphs to tipsy tale which as-yet has no title nor conclusion (nor comprehensible content!).

Specialty collectors in Club bring rarities to pass around for looksee. Foreign scientifantasayarns — French, German, Russian, Spanish, Esperantic. Original mss. ("Ardathia Machine Man," "Munan Golden Girl," "Futility," "2000 Miles Below," "Valeron," "Skylark," and others). Several scrapbooks featuring 1st-hand multicolored menagerie men, monsters, machines, etc., from ½ 100 real & imaginary places: planets, future time, 4th dimension, center Earth, Atlantis, atom, aso. "Mystery Solid Dimension Minus."

"Jekyll-Hyde," "Frankenstein," "White Zombie," "Berkeley Square," "King Kong," "Invisible Man" and number other imaginative movies've been revived in Great L. A.

Special session at EsperanTest's to meet Arthur K. Barnes, author "Green Hell" T.W.S. for June. Acquaintance also renewed at time with Wanda Test, former Sec'y our Chapt who once previously provided party with special cake icing-inscribed "Long Live SFL!". Opening pages Barnes' Venustory were read aloud while yet in mss. form and ideas advanced by interested attenders as to possible flora-fauna forms on Eve Star. Esperan-Test's scientificollection was seen. Scientifantasy Cinemauthority Ackerman audibly synopsized scientifiKarloffilm "Man Who Lived Again."

Another extra meeting—at Mussen's—where our gradually growing library was inspected. Most recent addition: Weinbaumemorial appreciatively accepted from Comrade Kuttner. Electricuriosities in L. Mussen's brother's lab were viewed. New Chapt. Constitution considered.

2 speakers've been T. Atlantis Sudbury, horologist secured by Sophia van Doorne telling time-measurement's history, and Mr. Feeley of LAJC, back by popular request and Al Mussen's influence discussing "Interplanetary Conquest's Dawn." Members were invited by Speaker Sudbury to attend coming chronometric convention, doings of which Exec. Ackerman described at following

(Continued on Page 126)

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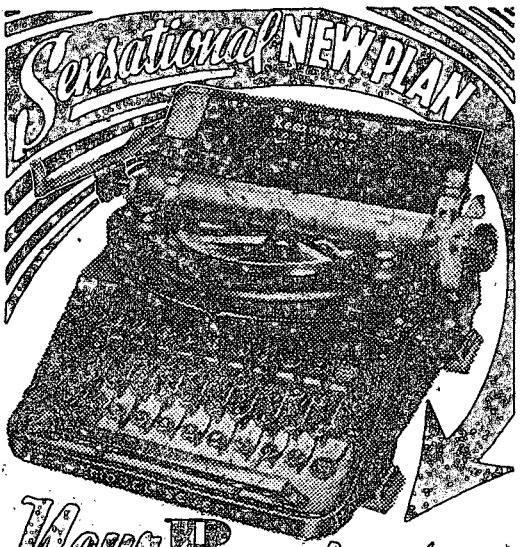

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(Continued from Page 124)

League meeting.

One of most extraordinary eves to date was held when Exec. Dir. and famous scientifantasy author Arthur J. Burks, FF (Fiction Factory) recently was in our midst as Honored Guest Speaker. The 24 there were delighted by Art's informality, fascinated by his amazing anecdotal ability, and unanimously voted him Honor Member our Chapt. He pictured to us such s-f celebs he's met personally as Mort Weisinger and "Fantasy's" Schwartz, aces Cummings & Ernst, etc.; told tales in connection creation his chapter of the interplanetaryarn, "Cosmos," and "Earth, the Maurauder"; related uncommon occurrences of which everyday objects round room reminded him, etc. It was an engrossing address, entertaining, informative.

Eve 1 Apr. saw scientifoolish fracas in SFL Chapt. 4. 8 pt program planned by "Whacky-Acky" included delivery series scientificrax adapted to those attending; strip-tease (er, "take-off") on old WONDER's Science Fiction Test altered to "SF Jest," slandering S. F. League (il-League-ally?) as "SFPlague"! Its adherents calumniated as "Science Afflictionist" fans of "pathetic" (profetic) fiction! etc.

Rarity raffles (1st SCOOPS, etc.); scientifi-contest with cash prizes; reading by Author Olsen In Person: his pixilated poem "My Martian Sweetheart" from "SF's 1st Fan Mag" "Time Traveler."

Meetings are 1st & 3d Thurs. every month in "Little Brown Room," Clifton Caf, 648 S. B'way, downtown LA. Approx 5 p.m. til 10. No invite necessary so local guys and gals come on and get associated with our group—meet your neighboring future-minded pals. (Free refreshments!).

THE GREATER NEW YORK CHAPTER OF THE SCIENCE FICTION LEAGUE

The Greater New York Chapter has concluded its first year of existence with something of a bang. Its organ, "The Cosmic Call," will see print by the middle of July; the membership of the Branch has doubled since its inception; and a permanent headquarters has been secured for next season.

Meetings have been suspended for the summer, but will be resumed sometime in September. Prospective members will please communicate with Frederik Pohl, Director, 677 Lincoln Place, Brooklyn, New York.

NEW MEMBERS
UNITED STATES

Jack McLaughlin, 2822 E. Superior Street, Duluth, Minnesota; Ted Simpson, 123 Carter Lake Club, Omaha, Nebraska; J. J. Schiffman, 683 Morton Street, Boston, Massachusetts; Francis Donahue, 339 Centre Street, Ashland, Pennsylvania; P. T. Pitty, Box 311, Ada, Oklahoma; William H. Fullet, 2216 Hawthorne Street, Swissvale, Pennsylvania; Herbert Mednick, 5442 Montgomery Avenue, Philadelphia, Pennsylvania; Milton Miller, 1154 President Street, Brooklyn, New York; Frank Davis, Rt. 1, Box 625, Raleigh, Tennessee; Dexter Hammond, 174 Broadway, Boston, Massachusetts; Donald Miller, 311 Hamilton Street, Kenmore, New York; Baldwin Toth, 223 Dayton Avenue, Clifton, New Jersey; Francis Litz, 365 Brown Street, Rochester, New York; Norman O'Connor, 125 Barre Street, Montpelier, Vermont; Wayne Power, Hermiston, Oregon; Louis Gladstone, 2434 Jackson Street, San Francisco, California; Donn Turner, 440 N. W. Francis, Wichita, Kansas; Robert Lanning, Box 505, Logan, Ohio; Bruce Blake, 507 North Street, Nacogdoches, Texas; William Bakker, Westbrook, Minnesota; Peter Poulos, 1011—9th Street, N. W., Washington, D. C.; Thomas Mall, 2216 Vine Street, Cincinnati, Ohio; W. P. Rawlinson, 1626 Pierce Avenue, Houston, Texas; Edward Torriale, 3437 St. Charles, New Orleans, Louisiana; Walter Faust, 1720 Seventh Street, New Orleans, Louisiana; Robert Kiteley, 837

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M. Wolf, 691 East 140th Street, New York City, New York; Richard Ogden, Jr., 352 East 139th Street, New York City, New York; Bill Losh, 151 Sycamore, San Mateo, California; Stanley Kolodzie, 209 Yantic Street, Norwich, Connecticut; Charles R. Ziegler, 388—19th Street, Brooklyn, New York; Ernest Sharp, 8247 Winser, Detroit, Michigan; Charles A. Wilkins, Jr., 28 Collier Rd., Atlanta, Georgia; Clarence Lasater, 133 Hunt Street, Durham, North Carolina; B. Reagan, 10th Ordnance Co., Langley Field, Virginia; M. E. Packman, Jr., 506 Napoleon Street, Valparaiso, Indiana; Adrian F. Nader, 115 N. Wittenberg, Springfield, Ohio; Nicholas Krikes; 524 Santa Clara Street, Fillmore, California; Gerald M. Loe, Box 92, Blanchardville, Wisconsin; Abraham Oshinsky, 117 Van Buren Street, Brooklyn, New York; Charles Wilkos, 1547 N. Talman Avenue, Chicago, Illinois; Jerome Keeley, Box 25, Merion Station, Pennsylvania; J. Ferguson Stewart, 362 Labadie Street, Montreal, Canada; Leroy Harsher, 1212 W. Cold Spring Lake, Baltimore, Maryland; George T. Branski, 1505 So. 70th Street, W. Allis, Wisconsin; Alan Gold, 1170 E. 8th St., Brooklyn, New York; Chas. Niccolls, Box 775, Pecos, Texas.

George Inglis, 725 Marion Street, St. Louis, Missouri; Wm. B. Woodington, 1555 Pratt Street, Philadelphia, Pennsylvania; R. Arcolese, 3208 Boulevard, Jersey City, New Jersey; Mike Sato, 2829 N. Abbott Ct., Chicago, Illinois; Vernon Crist, 1005 W. Barre Street, Baltimore, Maryland; George Winesdoerffer, 630 Nat'l Rd., Wheeling, West Virginia; Robert Thompson, 140-30 Sanford Avenue, Flushing, New York; Elden Janke, 1108 Grove Street, Topeka, Kansas; Sam Hoffman, 1653 Gladstone, Detroit, Michigan; Benny Cohen, 19 Rutgers Place, New York City, New York; Lester W. Smith, 1405 S. W. Washington, Portland, Oregon; Bernard W. Quinn, 2567 Tulip Street, Philadelphia, Pennsylvania; W. Garber Higginbotham, Box 23, Betheada, Ohio; Carl R. Seward, Appleton City, Missouri; M. Rubin, 350 Penn. Avenue, Brooklyn, New York; Alex Osheroff, 478—18th Avenue, Newark, New Jersey; Jesse J. Mayer, 400 East 29th Street, New York City; Roy P. Reisch, 138 Union Street, Millersburg, Pennsylvania; John Giunta, 1355—80th Street, Brooklyn, New York; Alan Brown, 2549 N. Monitor Avenue, Chicago, Illinois; Kenneth Jones, 1916 N. W. 40th, Oklahoma City, Oklahoma; James Sullivan, 882 Springfield Avenue, Summit, New Jersey; Billy Rosa, 1133 S. W. 23rd Avenue, Miami, Florida; Bernard Crowe, 1223 3rd Street, Portsmouth, Ohio; Royce M. Ingle, 1219 Evelyn Avenue, Berkeley, California; Charles Scholl, Box 442, Coytesville, New Jersey.

NEW MEMBERS
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John C. H. Drummond, 39 Jeffreys Street, Camden Town, London, N. W. 1, Middlesex, England; Wm. Conchar, 121 Wishark So., Glasgow, Scotland; Robert Willis, 112 Metcalfe Street, St. Thomas, Ontario; H. Shuttleworth, 206 Altrinchim Road, Sharston, Manchester, England; Chas. H. Roberts, 13 Despard Road, London, England; Edgar G. Ducker, 11, Birdwood Rd., Liverpool, England; George Smith, 1880 Favard Street, Montreal, Quebec, Canada; T. L. Gardini, 10 Westbourne Terrace W. 2, London, England; Robert Carley, Esq., 119 Boundary Road, London, E. 17, England; Andres Garcia Tramount, Industria No. 33, Altos, Habana, Cuba; Alex Englander, Public Works Dept. P. O. B. 502, Haifa, Palestine.

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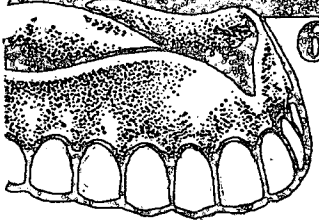

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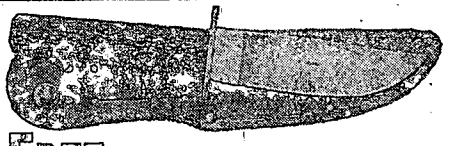

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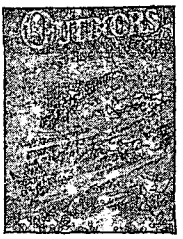

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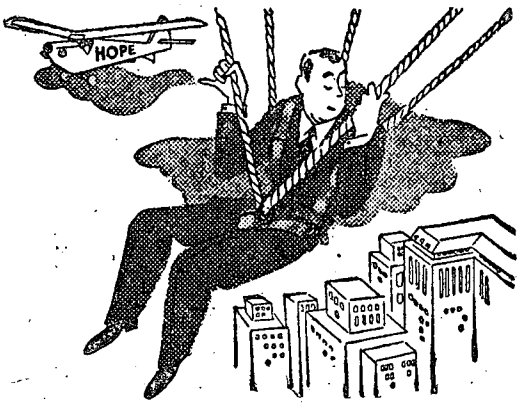

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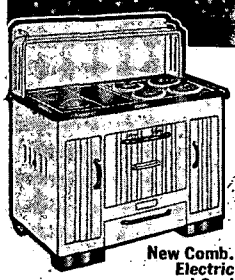

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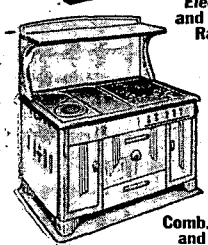

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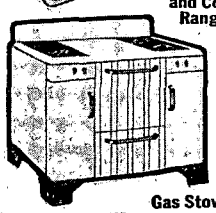

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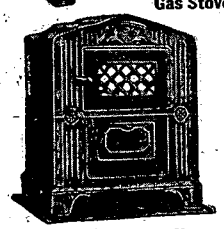

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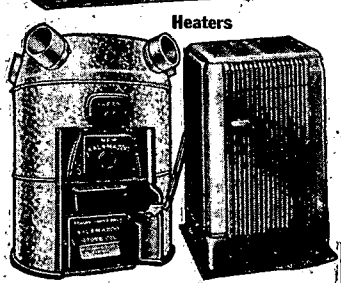

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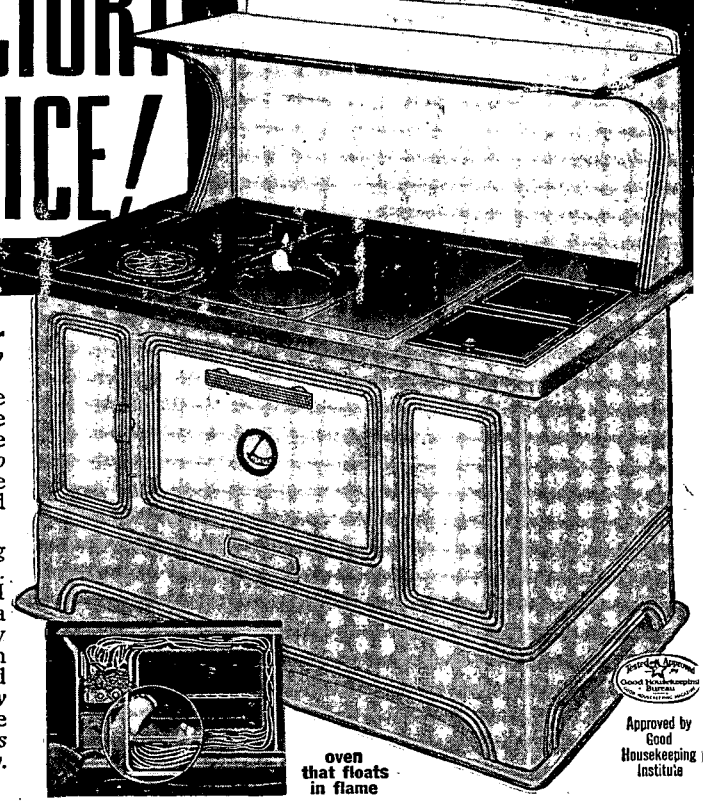

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